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5¾" L.O.	4½" L.B.	6 "	46	18, 20, 22, 24, 26
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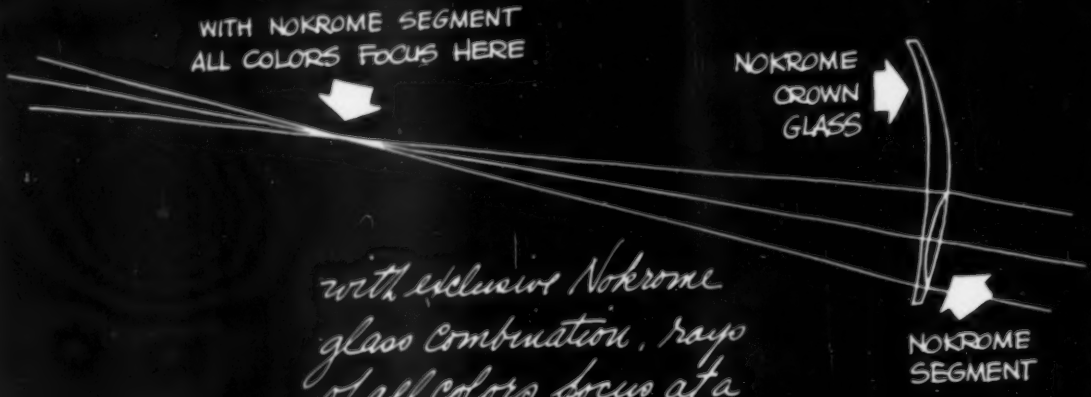

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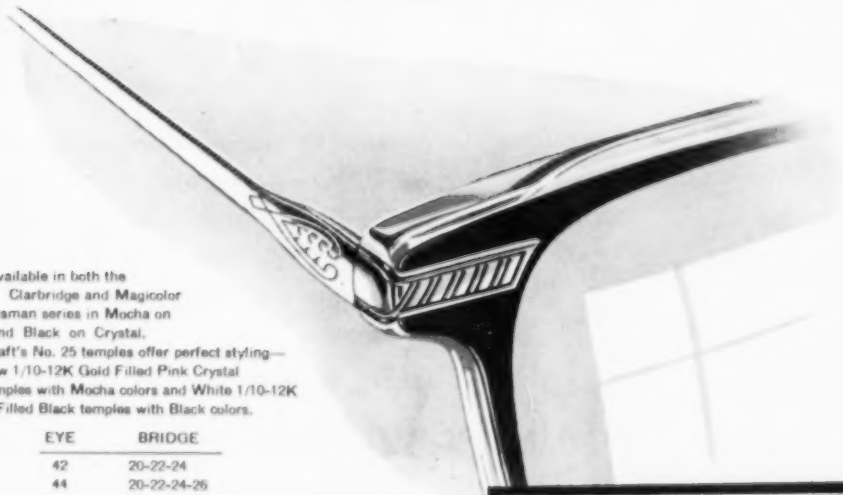

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STATE & CITY	DATE	TIME	TYPE COURSE	HOTEL
Kentucky:				
Louisville	Sun., April 15	1:00 p.m. to 5:00 p.m.	A & B	Henry Clay
Tennessee:				
Nashville	Sun., April 15	1:00 p.m. to 5:00 p.m.	A & B	Dinkler-Andrew Jackson
Knoxville	Mon., April 16	7:00 p.m. to 10:00 p.m.	A	Andrew Jackson Hotel
Chattanooga	Mon., April 16	7:00 p.m. to 10:00 p.m.	A	Hotel Patten
Georgia:				
Atlanta	Tue., April 17	7:00 p.m. to 10:00 p.m.	A & B	The Dinkler Plaza
North Carolina:				
Charlotte	Wed., April 18	7:00 p.m. to 10:00 p.m.	A	Hotel Charlotte
South Carolina:				
Columbia	Wed., April 18	7:00 p.m. to 10:00 p.m.	A	Hotel Columbia
Charleston	Wed., April 18	7:00 p.m. to 10:00 p.m.	A	Fort Sumter Hotel
West Virginia:				
Charleston	Fri., April 20	7:00 p.m. to 10:00 p.m.	A & B	The Daniel Boone
Ohio:				
Cincinnati	Sun., April 22	1:00 p.m. to 5:00 p.m.	A & B	Netherland Plaza
Columbus	Sun., April 22	1:00 p.m. to 5:00 p.m.	A & B	Deshler Hilton Hotel
Cleveland	Fri., April 27	7:00 p.m. to 10:00 p.m.	A & B	Hotel Statler
Akron	Fri., April 27	7:00 p.m. to 10:00 p.m.	A & B	Portage Hotel
Toledo	Wed., May 17	7:00 p.m. to 10:00 p.m.	A & B	Commodore Perry Hotel
Pennsylvania:				
Pittsburgh	Wed., April 25	7:00 p.m. to 10:00 p.m.	A & B	Hotel William Penn
Philadelphia	Wed., June 6	7:00 p.m. to 10:00 p.m.	A & B	Adelphia Hotel
Michigan:				
Detroit	Sun., May 20	1:00 p.m. to 5:00 p.m.	A & B	Hotel Statler
New York:				
Buffalo	Tue., May 22	7:00 p.m. to 10:00 p.m.	A & B	Hotel Statler
Syracuse	Wed., May 23	7:00 p.m. to 10:00 p.m.	A & B	Hotel Syracuse
Rochester	Thur., May 24	7:00 p.m. to 10:00 p.m.	A & B	The Sheraton Hotel
New York	Thur., June 7	1:00 p.m. to 5:00 p.m.	A & B	Hotel Roosevelt
Maryland:				
Baltimore	Sun., June 3	1:00 p.m. to 5:00 p.m.	A & B	Lord Baltimore Hotel
District of Columbia:				
Washington	Sun., June 3	1:00 p.m. to 5:00 p.m.	A & B	Hotel Statler
Virginia:				
Richmond	Mon., June 4	7:00 p.m. to 10:00 p.m.	A & B	Hotel John Marshall
Norfolk	Mon., June 4	7:00 p.m. to 10:00 p.m.	A & B	Commodore Moury Hotel
New Jersey:				
Newark	Thur., June 7	1:00 p.m. to 5:00 p.m.	A & B	The Douglas Hotel
Connecticut:				
Hartford	Sun., June 10	7:00 p.m. to 10:00 p.m.	A & B	Hotel Statler
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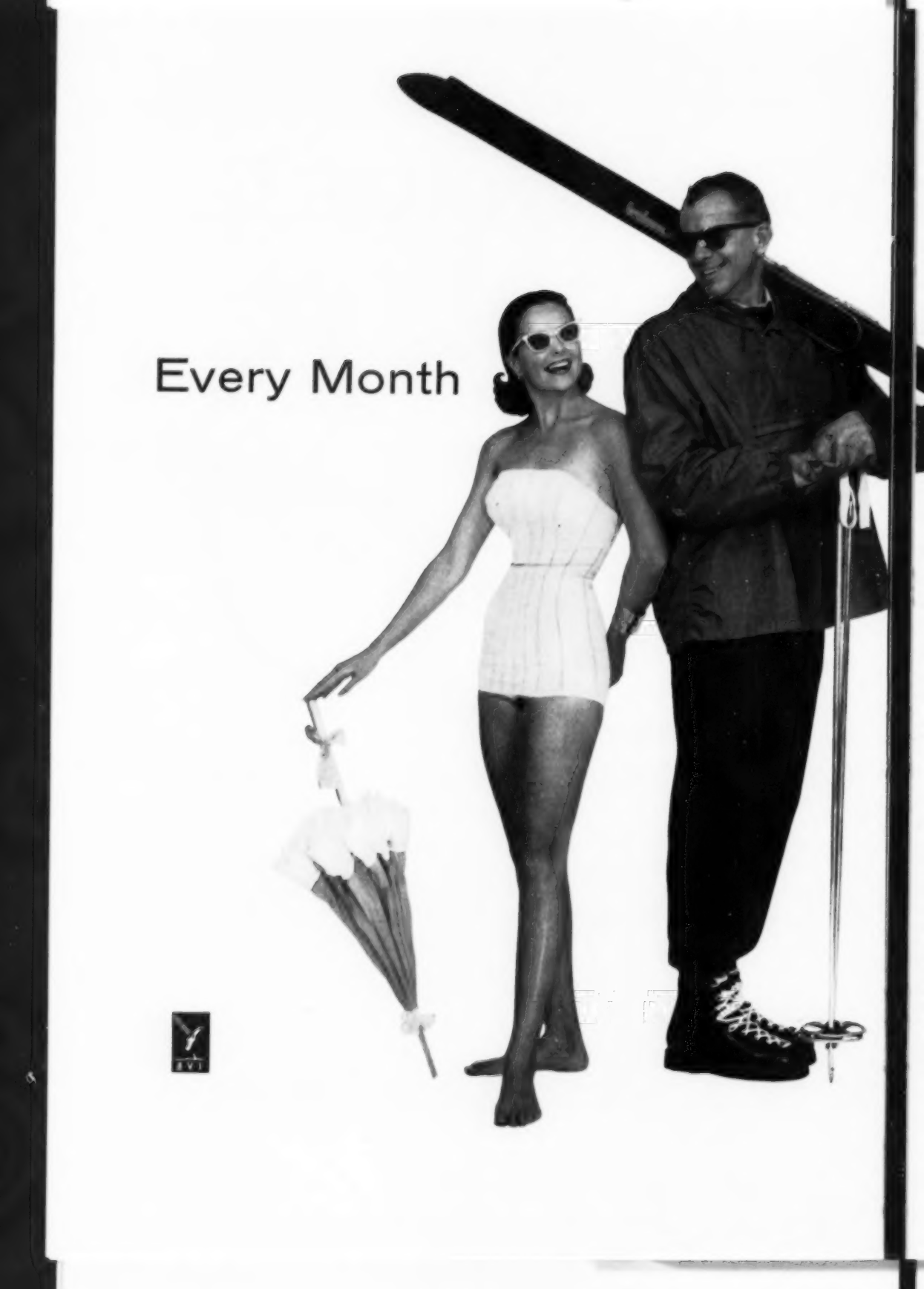
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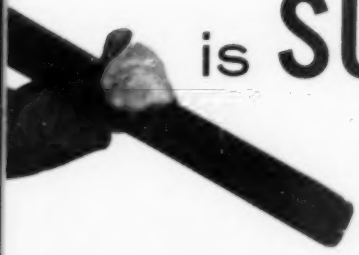

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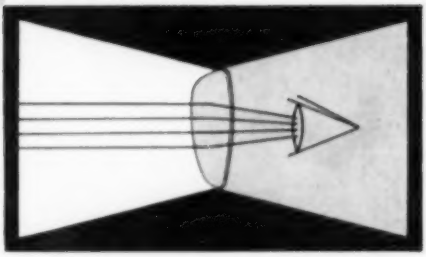

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PHYSIOLOGICAL FACTORS IN MULTIFOCAL CORRECTIONS*

II. CONSIDERATIONS OF OPTICAL FUNCTIONS AND PATIENT'S NEEDS

Robert E. Bannon†
Bureau of Visual Science, American Optical Company
Southbridge, Massachusetts

Recent papers[1] in opthalmological and optician's journals have discussed the clinical problems of presbyopia and offered suggestions on such practical matters as the selection and the fitting of multifocal lenses. These matters are also of everyday concern to optometrists. The infrequency of similar discussions in current optometric journals makes it seem worthwhile to review those aspects of multifocal corrections which are of clinical value.

In a previous paper[2] I reviewed the physiological factors that may be *measured* in determining near point corrections. Once these clinical measurements have been made, the *form* of the correction will have to be decided in accordance with the patient's individual needs and the optical characteristics of available opthalmic material.

PRESCRIBING NEAR CORRECTIONS: *Separate Near Glasses or Bifocals?*

Many patients, unaware of the benefits of bifocals, are reluctant to accept them. Some clinicians, therefore, prescribe a new single vision correction for close work only and have the patient continue to use his old distance correction when his chief complaint was related to close work only. In beginning presbyopia, the add for near is low and the patient's vision is not greatly blurred when he looks at distant objects through his near glasses. Yet, distance vision may be sufficiently blurred to be annoying, and for this reason it is always wise to demonstrate the limitations of separate near glasses by having the patient look through the new correction at distant objects as well as at near objects.

When a beginning presbyope states: "I hope I do not need bifocals yet," it is frequently helpful to say: "No, not necessarily; you may have just a pair of separate glasses for your close work since it is only

*Read before the annual meeting of the American Academy of Optometry, Chicago, Illinois, December 10, 1955. For publication in the April, 1956, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

†Optometrist. Fellow, American Academy of Optometry.

for such tasks that you have trouble. Of course, if you look at distant objects with your reading glasses, everything will be blurred."

This procedure helps to evaluate the patient's reaction to the prospect of being blurred for distance. Some patients will say that the blur for distance will not annoy them, but others will report immediately that it is intolerable. It is then an easy matter to point out that the blur for distance may be avoided by the use of bifocals.

Many patients think that it is the doctor's fault when they need bifocals. Therefore, it is important to tell them that it is the condition of their eyes which necessitates a certain correction. Usually, a patient is happier when he can participate in deciding whether separate near glasses or bifocals are preferable. It is not difficult for him to accept bifocals if he knows of the inconvenience of changing glasses for distance and near visual tasks. In fact, presbyopes who begin with separate glasses soon complain of blurred distance vision or the frequent need for changing glasses. Soon they request bifocals and are grateful, rather than resentful, when they finally obtain them. Another interesting aspect is that these patients often want to keep their separate near glasses in addition to their bifocals, not only as a spare pair but because they find them helpful for prolonged near work and for special tasks requiring a large field at the near point.

TEMPORARY DIAGNOSTIC GLASSES

Some practitioners find it helpful to prescribe for the beginning presbyope a pair of "temporary diagnostic glasses" in the form of separate near glasses or fitover lenses to be used over a distance correction. Such a procedure helps not only to determine the proper add but also its effect on the patient's fusional amplitudes.

A great number of patients wait until they need an add of 1.00 D. or more before seeking help. Considering that it is not uncommon to make changes of 0.25 D. or 0.50 D. in non-presbyopic cases, it seems remarkable that beginning presbyopes do not have more difficulty in adjusting to near corrections which often constitute changes two or three times greater than previously experienced. In cases where there is some doubt as to the amount of the add, the need of prisms or convergence training, a tentative prescription may be given either on a loan or rental basis. Such a correction provides diagnostic information drawn from the patient's subjective reactions as well as from findings taken after the patient has worn the correction for a few weeks.

A small number of plus spheres and fitovers can be very useful and convenient in providing adds to be used over the patient's distance glasses. When the patient has no distance correction, a temporary cor-

rection may be made up using 40 or 42mm. round lenses in an inexpensive metal frame. Round lenses can be used again in cases requiring different astigmatic axes. No great variety of such lenses is necessary since most cases requiring a significant refractive correction have already distance glasses over which plus spheres in fitovers can be used. Furthermore, there is a striking similarity in lens powers required for patients who have never worn glasses and are just beginning to need an add for close work.

Patients are usually appreciative of the consideration given their case when temporary diagnostic lenses are used. The period of beginning presbyopia is a crucial one in their lives. They are particularly grateful in not being hurried or forced into wearing bifocals which to many, are the "badge of old age." Yet, when given an opportunity of becoming gradually familiar with the benefits of near visual aids, they often become insistent regarding frequent examinations and corrective changes in order to be sure that they have the best for their eyes.

In some cases, there may be a question about the need for an add of +0.50 D. or 0.75 D. When it means an expensive pair of glasses to prove the point, decision is often deferred for a year or two. If the doctor says: "You are not quite ready for bifocals now, but you may be next year," the patient often waits two or more years because he (or she) dreads the prospect of wearing bifocals. However, if temporary diagnostic lenses are prescribed with the honest intention of determining their usefulness, many patients will report significant visual improvement and admit the need for the correction. Occasionally, a patient may want to continue using the tentative correction, but most patients are sufficiently style-conscious and concerned about their eyes to want the correction in a form more suitable to their individual requirements.

No one ever lost a patient by being too considerate, but patients have been lost through hurry and indifference. Temporary diagnostic lenses should be used more frequently because they enable the refractionist to study his patient in a period of important physiological and psychological adjustments. If the patient is made to understand this he will gladly cooperate so that his problem may be studied and the findings resolved toward an ultimate correction that will provide optimum visual comfort and efficiency.

BIFOCALS

On the other hand, there is much to recommend the early use of bifocals. Some patients adapt with less difficulty to a small add than to a large one particularly with the advantage of clear vision for distance and near at all times. These facts should be pointed out especially to

patients who would readily forego an optical advantage in order to avoid what they consider a "badge of old age." And incidentally, not only women want to conceal their age; men are fully as vain as women. Such patients usually want reading glasses and reject the idea of bifocals for constant wear. Often it is wiser to yield, and recommend an extra pair of bifocals for use in the privacy of their home or office, perhaps pointing out at the same time that removing reading glasses for viewing objects beyond arm's length may betray one's age more readily than bifocals. Nor do bifocals have to be worn constantly. In many cases it suffices to use them as the need arises for clear near and distance vision.

Image jump and object displacement are two optical properties of bifocals which are usually not considered in prescribing single vision lenses. Of course, image jump is not present in single vision lenses unless one looks across the lenses' edges. However, object displacement is present in single vision lenses whenever the line of vision does not go through the optical center of the lens. The two properties may be briefly defined as follows:

Image jump occurs at the upper edge of the segment as the line of vision passes from distance to near. It depends upon the power of the segment and the distance from the top of the segment to its optical center. The power of the segment is fixed by the prescription, but the location of the segment's optical center can still be chosen. The smaller the distance from the top of the segment to its optical center, the smaller the image jump.

Object displacement occurs when the line of vision is lowered, as in reading, some 8 to 10mm. from the optical center of the distance lens. A plus distance correction has a base up prismatic effect, whereas a minus distance correction has a base down effect at the reading level.

BIFOCAL TYPES

There are three principal bifocal types in common use today. They are:

(1) Fused round segment bifocals
(2) One piece bifocals
(3) Fused cut-off bifocals

The advantage of the fused round segment bifocal is its inconspicuousness. The better bifocal lenses of this type have practically no color aberration in the segments and, they are corrected for marginal power errors. Since the optical center of the fused round segment is 10 or 11mm. below segment top there is a noticeable image jump. However, object displacement at the usual reading level is reduced in plus distance corrections, but is increased in all minus powers.

Most one-piece bifocals are nearly as inconspicuous as fused round segment bifocals, and there is no perceptible color aberration. Exceptions are cases of prism power combined with high adds, and strong minus corrections. The main advantage of the one-piece bifocal is the availability of large segments. The better bifocals of this type are corrected for marginal power errors. In the usual one-piece bifocal, there is considerable image jump since the optical center may be as far as 19mm. below the top of the segment. However, object displacement is reduced in plus corrections whereas it is markedly increased in minus corrections. In the newest one-piece bifocal, the optical center of the segment is at the top of the segment; hence, there is no image jump and object displacement is practically the same as in equivalent reading glasses. Besides having the advantage of a large near point field for presbyopic cases, this bifocal has also been found useful in non-presbyopic applications.[8]

The fused cut-off bifocal is, the writer believes, the best general-purpose bifocal. It has an inconspicuous, color-free, and reflection-free segment which generally provides an adequate reading field. Since the segment's optical center is usually about 4mm. below the top of the segment there is a minimum of image jump, and the object displacement is the same as in single vision lenses.

FACTORS IN BIFOCAL SELECTION

Optical—The selection of a bifocal ground on corrected curve lenses which correct for marginal errors of astigmatism and spherical power is the first consideration for maximum patient benefit. Although in weak powers the superiority of corrected curves may seem slight, nevertheless, the assurance of best quality workmanship and accuracy should be sufficient reason for prescribing corrected curves for all powers. There are few patients who would knowingly accept anything but the best for their vision, just as they would expect the best quality medicines from their pharmacist. The most insidious chicanery is practiced by those who charge for the best but provide something less than the best in quality.

The optical factors of image jump and object displacement are more or less important clinically, depending upon the patient's experience with glasses. One who has a significant degree of ametropia and has worn single vision lenses for several years has become accustomed to the prismatic effects of lenses at points away from the center. Such a person will have little or no difficulty in becoming adjusted to bifocals. This is especially true if the visual habits he has perfected with respect to single vision lenses are not changed radically. A cut-off type bifocal seg-

ment introduces a minimum of image jump and has practically the same amount of object displacement as his single vision lenses.

Ametropes of slight degree who have not worn lenses constantly are usually the ones who find it difficult to adjust to their first bifocals. As mentioned previously, such people frequently adjust more easily to their first bifocals after some experience with separate reading glasses. In prescribing the first bifocals for hyperopes, a choice must be made between image jump and object displacement. Object displacement may present the greater difficulty to patients without previous corrections. In minus correction, the cut-off segment will have a minimum of image jump and object displacement. Since most myopes will have had experience with single vision lenses, these cases present less difficulty than those who require a slight hyperopic correction for distance.

In other words, with respect to image jump and object displacement, the cut-off segment is optically preferable except for the slight or moderate hyperope who has not worn a distance correction constantly. The hyperope who has worn a distance correction is accustomed to the object displacement caused by looking below the center of his lenses. An attempt to correct some of the object displacement in such a case by prescribing round segments often results in dissatisfaction because the image jump is intolerable. In general, image jump is more annoying than is object displacement.

SEGMENT HEIGHT

Clinical practice has indicated that it is a good general rule to have the top of the segments level with the upper margin of the lower eyelids when the patient's eyes are in the primary straight ahead position. This usually calls for the top of the segments to be at least 2mm. below the optical centers of the distance lenses. The segment should be low enough so that the patient can easily and naturally look over the tops at the ground fifteen to twenty feet in front of him. On the other hand, the segments should be high enough to permit easy reading or looking at close objects with a natural depression of the eyes.

Cut-off segments can often be fitted 1 to 1½ mm. lower than round segments. It is usually best to fit the first bifocals a little low and to raise them as the patient becomes more accustomed to his bifocals. This is possible when the frame or mounting has adjustable nose pads. Another method is to introduce more than a normal amount of temple tilt, which also will lower the segments. Of course, it must be remembered that in strong corrections, the power errors introduced by tilting the lenses may affect the advantage gained. Fortunately, the cases requiring adjustments in segment height are the moderate hyperopic cases for which the power errors introduced by tilting are negligible.

The patient's natural posture should be observed while he is simulating his working conditions. A stout person who holds his head erect or well back will need a lower segment than a thin person who leans over his near working field. A carpenter, painter, or electrician who must climb ladders or work on scaffolding may need a lower segment than a desk worker, machinist, or barber who maintains pretty much the same posture for hours.

For certain sports or hobbies which require a large distance field, lower segments are preferable. Often, it is difficult, if not impossible, to meet all requirements resulting from occupations, sports, and hobbies with a single suitable segment height. All the clinician can do is to prescribe for the principal visual task, and give modified corrections when the patient seeks to have additional demands satisfied. The best procedure is to prescribe for the patient's *chief complaint* first and have it understood that this correction may not be suitable for other purposes. It is wise to point out that a certain segment height is indicated for the patient's occupation, but that it may not be satisfactory for other purposes.

UNEQUAL SEGMENT HEIGHTS

The same segment height for each eye is the rule in most cases since the two eyes are usually on the same level. However, there are patients with one eye higher than the other and, in such cases, it is necessary to have one segment higher than the other in order that each segment top is the same distance below its respective pupil. This procedure is far better than placing the top of the segments equally with respect to the pupils by rotating the frame, which would not only introduce an error in the cylinder axes but exaggerate the asymmetry of the patient's eyes and brows, thus creating an unsatisfactory cosmetic effect.

SEGMENT WIDTH

Some patients think they require a large bifocal segment because of their particular occupation. How wide a field of view is provided even by a relatively small segment is frequently not realized. Also, the increase of the field of view through the natural rotation of the head is often overlooked. While it is possible for the eyes to move laterally more than 60°, clinical evidence has indicated that in fixating near objects located more than 10° to the right or left of the median plane, the head rotates so that the eyes do not need to move more than 10°.

A 20mm. wide segment provides a reading field which subtends an angle of 33° or a linear width of *10 inches* at 16-inch reading distance. Standard size business stationary is 8½ inches wide, and usually has a

margin of about 1 inch on each side so that the type presents a lateral field of only *6½ inches*. This can be seen through the segment without head movement. Most book pages are less than 6 inches wide. Hence, for routine desk work and general bench work, a 20mm. wide segment is usually adequate. Some occupations may require a larger than normal near field and for these cases the large segment bifocal should be used. *Table No. 1* gives the size of the field for various segment widths at different near point distances.

TABLE NO. 1

LATERAL FIELD OF VIEW THROUGH VARIOUS SEGMENT WIDTHS

Visual Distances	*13 Inches*		*16 Inches*		*20 Inches*	
Maximum Width of Segment	Inches	Degrees	Inches	Degrees	Inches	Degrees
12mm.	4.40″	17.77°	5.32″	17.71°	6.54″	17.65°
16mm.	6.38	25.55	7.72	25.48	9.50	25.42
20mm.	8.36	33.09	10.12	33.02	12.46	32.96
22mm.	9.35	36.83	11.32	36.69	13.94	36.62
24mm.	10.34	40.36	12.52	40.28	15.42	40.21
26mm.	11.33	43.87	13.72	43.79	16.90	43.72
28mm.	12.32	47.30	14.92	47.22	18.38	47.15
30mm.	13.31	50.62	16.12	50.56	19.86	50.49
34mm.	15.28	57.04	18.52	56.97	22.82	56.90
38mm.	17.26	63.08	20.92	63.01	25.78	62.94

NOTE: As basis for computing, the following constants were assumed:
Power: +2.00 D. addition; Pupil Size: 3mm. (Allowance was computed to prevent edge of segment splitting the pupil); Vertex Distance: 13.75mm.; Center of Rotation: 27mm. from vertex of lens; Area of Segment Used: The widest part.

SEGMENT DECENTRATION

To provide coincidence of the monocular visual fields at the binocular point of fixation requires accurate positioning of the bifocal segments. The proper amount of decentration depends not only on the interpupillary measurement but also on the near fixation distance, the distance of the spectacle lenses from the center of rotation of the eye and the horizontal prismatic effect of the distance lenses at the reading level. All these influencing factors have been considered in a six-part chart prepared by Boeder[4] several years ago. The following approximations indicate the relative value of various factors in determining segment placement:

For every 5 D of plus power in the horizontal meridian segment decentration should be increased by about 0.2mm. and decreased by about 0.2mm. for every 5 D of minus power.

For fixation distances closer than 16″, segment decentration should be increased by about 0.2mm. per inch and decreased by about 0.1mm. per inch for fixation distances beyond 16″.

For eyewire distances less than 12mm., segment decentration should be decreased by about 0.1mm. per millimeter, and increased by about 0.1mm. per millimeter for eyewire distances greater than 12mm.

Table No. 2 provides a comparison of the interocular distances for various fixation distances when the lateral separation of the visual axes is measured by the corneal reflex method described by Guibor[5] (1943); Stimson[6] (1951); and Murroughs[7] (1955).

TABLE NO. 2
CALCULATED INTEROCULAR DISTANCE
WHEN FIXATION IS AT:

Near Interocular Distance Measured* With Fixation At 16 Inches	10"	13"	20"	26"	40"	5'	10'	15'	20'	Inf.
52mm.	50.1	51.2	52.7	53.3	54.0	54.5	55.0	55.1	55.2	55.5
53mm.	51.1	52.2	53.7	54.3	55.0	55.6	56.0	56.2	56.3	56.5
54mm.	52.1	53.2	54.7	55.4	56.0	56.6	57.1	57.2	57.4	57.6
55mm.	53.0	54.2	55.7	56.4	57.1	57.7	58.1	58.3	58.4	58.7
56mm.	54.0	55.2	56.8	57.4	58.1	58.8	59.2	59.3	59.5	59.7
57mm.	55.0	56.2	57.8	58.4	59.2	59.8	60.2	60.4	60.6	60.8
58mm.	55.9	57.2	58.8	59.5	60.2	60.8	61.3	61.5	61.6	61.9
59mm.	56.9	58.1	59.8	60.5	61.3	61.9	62.4	62.5	62.7	62.9
60mm.	57.9	59.1	60.8	61.5	62.4	62.9	63.5	63.6	63.7	64.0
61mm.	58.8	60.1	61.8	62.5	63.4	63.9	64.5	64.6	64.8	65.1
62mm.	59.8	61.1	62.8	63.5	64.4	65.0	65.6	65.7	65.8	66.1
63mm.	60.8	62.1	63.8	64.6	65.5	66.0	66.6	66.7	66.9	67.2
64mm.	61.7	63.1	64.8	65.6	66.5	67.0	67.7	67.8	68.0	68.3
65mm.	62.7	64.1	65.9	66.6	67.5	68.1	68.7	68.9	69.0	69.3
66mm.	63.7	65.1	66.9	67.6	68.6	69.1	69.8	69.9	70.1	70.4
67mm.	64.6	66.0	67.9	68.7	69.6	70.2	70.9	71.0	71.2	71.5
68mm.	65.6	67.0	68.9	69.7	70.6	71.3	71.9	72.0	72.3	72.5
69mm.	66.6	68.0	69.9	70.7	71.7	72.4	73.0	73.2	73.4	73.6
70mm.	67.5	69.0	70.9	71.7	72.7	73.4	74.0	74.2	74.4	74.7

*By corneal light reflection method. Center of Rotation taken as 27mm. from vertex of lens.

Despite the importance of all the variables which affect accurate segment decentration, it is still a common practice simply to decenter the segment 1½ or 2mm. in. Also, the segments are usually displaced the same amount for each eye which assumes that each pupil is equidistant from the nasal crest and that the fixation point is in the median line requiring symmetric convergence. However, if measurements are taken it will be frequently found that one eye is further than the other from the center of the nose. Observation of patients' near visual habits will also indicate that the work material is often to the right or left of the midline, depending upon the handedness. A right-handed person tends to place his reading or writing material to the right side and hence converges more with his left eye. Many occupational tasks require near point fixation at points other than on the median line.

In view of all the variable factors involved, it may be questioned if the visual fields through multifocal segments ever coincide. Fortunately, with the large size segments so commonly used and the patient's adaptability in moving his head, satisfactory overlapping of the visual fields is achieved in most cases. Nevertheless, consideration of the various optical factors which influence segment placement as well as allowance for the patient's posture and visual habits is often necessary in prescribing for those patients who have difficulty in adjusting to multifocal corrections.

OCCUPATIONAL REQUIREMENTS

An understanding of the patient's working requirements is essential in prescribing the proper add and segment specifications. Artists, bookkeepers, draftsmen, etc., have requirements at near different from those of farmers, carpenters, bus or taxicab drivers. Frequently, clear vision between distance and near is necessary. If the patient is sufficiently presbyopic, only trifocals will supply the necessary range. On the other hand, multifocals may not be advisable on certain jobs involving climbing or scaffold work. If an additional near correction is prescribed here, it may be provided in flip-up fronts.

While one pair of bifocals may be suitable for a patient's occupation, they may not be adequate for other uses. In such circumstances, a second or third pair of glasses is necessary. For example, the patient needing large segment bifocals for his work may find them a handicap while playing golf. A second pair of glasses with small segments will prove ideal for golf.

The beginning practitioner all too often errs by prescribing only one pair of multifocal lenses for all visual tasks. This is tantamount to restricting surgeons to one instrument, photographers to one camera, machinists to one tool, housewives to one mechanical or electrical appliance, athletes to one type of equipment, etc. Many people use different shoes for work, dress, and sports—as well as different clothes and other accessories. A person should not be limited to one pair of glasses for all his visual needs when he may enjoy benefits which are often more important than those provided by wearing apparel. An intelligent analysis of the patient's visual requirements—not only for his work, but also for his hobbies and his sports—will often determine the need for multiple corrections.

A check list or occupational analysis form is helpful in reviewing the patient's visual needs. In addition to a comprehensive case history and the refractive and motility data, such a form should include a detailed description of the patient's occupation and hobbies including

the size, location and distance of objects to be seen; the patient's height, posture, and arm reach; the width of visual field required; the range of visual distances; the presence of glare, ultraviolet and infrared radiations; the possibility of flying particles, dust, fumes, etc. The fundamental purpose of such an analysis is, of course, to provide the patient with maximum comfort and efficiency.

It is also important to know when *not* to prescribe. Every presbyope does not need two or three pairs of glasses. I will never forget the illiterate patient who was given "reading glasses" or the young woman who was given an accurate refractive correction which did not relieve her complaint of profuse tearing while peeling onions!

Frequently, extra glasses may be unnecessary if a recommendation is made for increased illumination; for rearrangement of the work situation by moving the visual task closer or further away; or for the use of a magnifying glass or a loupe either held by the worker, attached to his glasses, or mounted before the visual task. Also, as pointed out by Hanman,[8] maximum vision may not be necessary for certain tasks. A visual acuity of 20/60 or 20/80 may be sufficient to identify certain objects even though 20/20, or even 20/10, may be required for other objects. Assuming illumination, contrast and other factors to be adequate, a convenient estimate of the visual acuity required for a certain object may be made according to the visual angle subtended; that is, by using the Snellen principle. *Table No. 3* shows the approximate visual acuities required for certain distances and sizes of objects.

First-hand knowledge of the patient's work is undoubtedly a great asset in prescribing multifocal corrections. Visits to factories, offices, and stores where patients are employed is an excellent way to become familiar with their various visual needs. The location, distance, and size of objects may be measured. The general illumination, brightness, contrast, motion and exposure time as well as other factors should be noted.

There are many excellent books and articles which describe various manufacturing procedures and other occupations. One such book is the *Occupational Outlook Handbook*, published by the U. S. Department of Labor in cooperation with the Veterans Administration (Bulletin No. 998, distributed by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., Price: $3.00). This book prepared for teachers and guidance counselors, provides a wealth of information on 433 specific occupations, representative of almost every field of work. The visual aspects are not specifically defined, but from the descriptions and the many fine photographs, it is relatively easy to estimate the visual needs involved.

TABLE NO. 3

APPROXIMATE VISUAL ACUITIES*
WHEN OBJECT IS AT:

Overall Size of Object (Inches)	10″	12″	14″	16″	20″	24″	3′	4′	5′	10′	20′
1/64″	20/20	20/18	20/15	20/13	20/10	20/9	20/6	20/4	20/4	20/2	20/1
1/32	40	35	30	25	20	18	13	9	7	4	2
1/16	80	70	60	50	40	35	25	18	15	7	4
1/8	175	150	125	100	80	70	50	35	30	15	7
1/4	350	300	250	200	170	150	100	70	60	30	15
1/2	700	600	500	400	350	300	200	140	120	60	30
1			1000	800	700	600	400	300	200	120	60
1 1/2					1000	900	600	400	350	170	80
2							800	600	450	200	120
2 1/2							1000	700	600	300	150
3								900	700	350	170
4									900	450	200
6										700	350
8										900	450
10											600
12											700

*Based upon the Snellen principle that an object subtending a five minute angle overall with one minute detail is equivalent to 20/20.

It is a common mistake in prescribing for near vision to neglect consideration of *how far away* people need to see clearly for their work in the factory, office, or home. A patient may say his work is at arm's length, but he may not mention the kind of work or the tools he uses. Some tasks are better described as "arm's length plus a tool." The tool may make the object of regard farther away than arm's length by as much as 3 inches to 3 feet, for instance, the housewife with her electric iron or vacuum cleaner, and the carpenter with his hammer or saw. It is clear that a prescription suitable for the usual reading task will have too short a focus for clear vision at "arm's length plus a tool."

DETERMINING THE ADD FOR A NEW VISUAL DISTANCE

It is often routine practice to measure the add for an arbitrary near point, such as 13, 14, or 16 inches. However, an add for some other visual distance should also be measured under conditions simulating the work situation. As pointed out by *Ripple*,[1] the amplitude of accommodation may vary markedly in different directions of gaze. In elevated near vision, accommodation is usually less than in the more normal depressed gaze. Hence, overhead near work may require a stronger add in an inverted segment.

A patient may change his work or acquire new interests which necessitate a near correction for a new visual distance. If it is not possible or convenient to make measurements, the change in add for the new visual distance can be estimated by the *dioptric* difference between the new and the original visual distances. For example:

1. Assume that an add of +2.00 D has been satisfactory for 16 inches and that the patient requires a new correction for near work at 10 inches. The diopiric difference between 10 inches (4.00 D) and 16 inches (2.50 D) is +1.50 D. Hence, 1.50 D more is needed at 10 inches. The original 2.00 D plus 1.50 D more gives a total add of 3.50 D for 10 inches.

2. Assume that a +2.00 D add is satisfactory for 13 inches and that a new correction is necessary for about arm's length or 26 inches. The diopiric difference between 26 inches (1.50 D) and 13 inches (3.00 D) is —1.50 D. Hence, 1.50 D less is needed at 26 inches, or 2.00 D — 1.50 D gives 0.50 D for 26 inches.

This simple procedure assumes the use of the same amount of accommodation for both original and new visual distances. *Table No. 4* provides a convenient means for determining new additions for various working distances.

TABLE NO. 4

TABLE FOR DETERMINING THE PROPER ADDITION FOR NEW WORKING DISTANCES

Working Distances

8″	10″	12″	13″	14″	16″	18″	20″	22″	26″	32″	40″
5.00D	4.00D	3.25D	3.00D	2.75D	2.50D	2.25D	2.00D	1.75D	1.50D	1.25D	1.00D
4.75	3.75	3.00	2.75	2.50	2.25	2.00	1.75	1.50	1.25	1.00	.75
4.50	3.50	2.75	2.50	2.25	2.00	1.75	1.50	1.25	1.00	.75	.50
4.25	3.25	2.50	2.25	2.00	1.75	1.50	1.25	1.00	.75	.50	
4.00	3.00	2.25	2.00	1.75	1.50	1.25	1.00	.75	.50		
3.75	2.75	2.00	1.75	1.50	1.25	1.00	.75	.50			
3.50	2.50	1.75	1.50	1.25	1.00	.75	.50				
3.25	2.25	1.50	1.25	1.00	.75	.50					
3.00	2.00	1.25	1.00	.75	.50						
2.75	1.75	1.00	.75	.50							
2.50	1.50	.75	.50								
2.25	1.25	.50									
2.00	1.00										
1.75	.75										
1.50	.50										

PROCEDURE:
1. Locate the column for the working distance used in prescribing.
2. Move down to the entry for the prescribed addition.
3. Move horizontally to the column for any other desired working distance.
4. Read the new addition.

TRIFOCALS—INDICATIONS AND USE

After a presbyope has used a +1.50 D add for several months, he is rarely aware of any difficulty in seeing clearly and comfortably in the wide range of intermediate near vision distances. When he is rested, he will see clearly across the room and as close as 20 inches through his distance correction. (*See Table No. 5.*) Nor has he any trouble seeing from about 26 inches to about 11 inches through his bifocal segments. However, when he is tired and cannot use his full amplitude of accommodation, he begins to notice that certain objects are blurred at some intermediate distances through the upper or lower part of his glasses. This blurring is noticed first only temporarily. In talking with someone, the patient may notice that he cannot see the other person's face clearly; or, while eating he may notice that certain things on the table

TABLE NO. 5

TABLES SHOWING RANGE OF CLEAR VISION THROUGH DISTANCE, BIFOCAL, AND TRIFOCAL ADDS FOR VARIOUS AMPLITUDES OF ACCOMMODATION

Amp. Accom.	Add for 16″	Range of Clear Vision: Thru Dist. Rx	Bifocal Seg.	Trifocal Int.
3.00 D	1.00 D	∞ to 13″	40″ to 10″	80″ to 11″
2.50 D	1.25 D	∞ to 16″	32″ to 11″	64″ to 13″
2.00 D	1.50 D	∞ to 20″	26″ to 11½″	53″ to 14″
1.50 D	1.75 D	∞ to 26″	23″ to 12″	46″ to 17″
1.00 D	2.00 D	∞ to 40″	20″ to 13″	40″ to 20″
0.50 D	2.25 D	∞ to 80″	18″ to 14″	36″ to 25″
0.00 D	2.50 D	∞	16″	32″

Amp. Accom.	Add for 13″	Range of Clear Vision: Thru Dist. Rx	Bifocal Seg.	Trifocal Int.
4.00 D	1.00 D	∞ to 10″	40″ to 8″	80″ to 9″
3.50 D	1.25 D	∞ to 11″	32″ to 8½″	64″ to 9½″
3.00 D	1.50 D	∞ to 13″	26″ to 9″	53″ to 10½″
2.50 D	1.75 D	∞ to 16″	23″ to 9½″	46″ to 11½″
2.00 D	2.00 D	∞ to 20″	20″ to 10″	40″ to 13″
1.50 D	2.25 D	∞ to 26″	18″ to 10½″	36″ to 15″
1.00 D	2.50 D	∞ to 40″	16″ to 11″	32″ to 18″
0.50 D	2.75 D	∞ to 80″	14″ to 12″	29″ to 21″
0.00 D	3.00 D	∞	13″	26″

NOTE: The bifocal adds are based upon the common clinical practice of keeping at least half the amp. of accom. in reserve. The trifocal power is 50% of the bifocal add. Also, as in clinical practice, 40″ (rather than 39.37″) are regarded as equivalent to 1 meter (1.00 D), and no allowance is made for depth of focus or influence of proximity.

are blurred. Efforts to see these various objects clearly by tilting the head and looking first through the upper and then the lower part of his glasses lead to frustration and annoyance.

Eventually, the patient returns to the doctor and—several months, even a year or two, having passed since the previous examination—is found a little more presbyopic. The doctor finds that an add of 1.75 D. or even 2.00 D. is now necessary for the patient's near working point of 16 inches. If his problem relative to intermediate distance is overlooked and new bifocals with 1.75 D. or 2.00 D. adds are prescribed, trouble really begins. Let us assume, for example, a 2.00 D. add is given for 16 inches, allowing half the 1.00 D. amplitude of accommodation to remain in reserve. If he uses this reserved accommodation, he can see clearly through the segment up to 13 inches and if he relaxes his accommodation, he can see through the segment out as far as 20 inches. Through the upper part of his glasses, he can see clearly only up to 40 inches by using all his accommodation. Hence, while the new glasses are satisfactory for reading at 16 inches, the patient finds to his disappointment that from 20 to 40 inches everything is blurred: in fact, much more blurred than with his old glasses. Instead of solving his problem, his new glasses made it worse.

The doctor may suggest that the patient use his old glasses for arm's length tasks and use his new bifocals for close work. However, this will not make the patient happy as his recent visit to the doctor was prompted by the fact that the old glasses seemed inadequate and he hoped to receive a prescription that would satisfy both his near and intermediate needs. The proper prescription would be trifocals with a +2.00 add in the lower segment and a +1.00 add in the intermediate segment. *Table No. 5* indicates the range provided by such a correction. Through the distance portion, the patient can see clearly up to 40 inches by using his remaining 1.00 D. of accommodation. Through the intermediate segment of 1.00 D., he will see clearly at 40 inches by relaxing his accommodation and also at 20 inches he will see clearly by accommodating 1.00 D. The bifocal segments plus his 1.00 D. of accommodation provide clear vision from 20 inches to 13 inches. Hence, he will see clearly the entire range from distance to a near point of 13 inches through trifocal lenses.

When the near add is +2.50 D. for a 16-inch near point, the patient has become an absolute presbyope and has no significant accommodation. Fortunately, there is some depth of focus amounting to about 0.25 D. to 0.50 D. which allows a range of an inch or two either side of optimum clearness. This factor can be assumed as constant for the same individual and hence as affecting all findings by the same amount.

If an absolute presbyope is given a full distance correction with an add of +2.50 D. for 16 inches in trifocals having an intermediate section 50% of the add, he will see clearly at distance, at 16 inches, and at 32 inches. Although practitioners most frequently prescribe a 50% add for the intermediate segment, a patient's work may occasionally call for an intermediate focus closer than 32 inches. In such cases, a 66% intermediate may be given which permits clear vision at about 24 inches.

An intermediate segment having about one-third of the power in the reading add, when the latter is +1.50 D., has become available. However, as shown in *Table No. 5*, the ranges of clear vision overlap with a +1.50 D. add and a 50% intermediate. If the intermediate is 33%, the overlapping shifts only slightly, i.e., to the extent of 0.25 D. A person requiring a +1.50 D. add for the optimum reading distance of 16 inches has 2.00 D. of accommodation on the basis of maintaining half his amplitude in reserve and whether he uses 0.25 D. more or less accommodation is inconsequential. Clinical experience over the period of many years has clearly indicated that a 50% intermediate is most useful in the vast majority of cases.

In determining the height of the trifocal segment, the same considerations should be followed as in the case of bifocals: the patient's posture, whether he holds his head erect or tipped forward; the type of work in which the patient is engaged; the height of the former bifocal or trifocal segments; and the adjustability of the frame or mounting that is to be used. In general, it is standard practice to fit the top of the *lower* segment the same height as for cut-off bifocal segments. This will cause the top of the intermediate segment to be 6 to 7mm. above that of the lower segment, depending upon the type of trifocal used.

To those who have not prescribed many trifocals, this procedure may seem to place the trifocal segment too high. However, this is the procedure that most clinicians and dispensers have found to be most effective. Occasionally, it may be desirable to adopt the more conservative technique of placing the top of the reading segment 1 to 2mm. lower than usual. As the patient becomes accustomed to the new correction, the height of the segments can be raised by a slight adjustment of the frame or mounting. It is important to keep in mind that for trifocals, as well as bifocals, a frame or mounting that can be adjusted—raised or lowered—should be selected. Furthermore, the patient should understand when he is given the new correction, either trifocals or bifocals, that the first adjustment is not the final one. He should be encouraged to return for a "progress report" and modifications in the height and angling of the frame or mounting.

The possible benefits of a trifocal correction should be determined not only from an analysis of the ocular measurements but also by a consideration of the symptoms, complaints, occupation, and needs of the patient. A previous study[8] based upon 22,640 trifocal corrections indicated clearly that the *need of the patient* for clear vision at various distances was the most significant clinical factor. Of course, patients are not always aware of the limitations of their bifocals or that clear vision at an intermediate distance is possible. The conscientious practitioner learns to judge patients' needs by a careful case history and evaluation of the dioptric data. Some clinicians help their patients by demonstrating the ranges of clear vision through both bifocal and trifocal tentative corrections. If it is routine practice to improve vision only at 20 feet and 16 inches, it is possible for the important intermediate range from 20 to 40 inches to be neglected in many patients who would appreciate the maximum flexibility of vision afforded by trifocals.

Presbyopic individuals always hope to continue the visual efficiency and comfort which they enjoyed in earlier years. They may not under-

stand the limitations of their reduced accommodation if provided with no choice but clear vision for only two restricted ranges—near and far. Many older people become unnecessarily resigned to limited visual performance because they are not made aware of the variety of modern multifocal aids which can help them to enjoy again what they once knew as "youthful vision."

SUMMARY

The wide range of near point needs in various occupations, in the home, and in recreational activities, with the numerous lens forms currently available, makes it necessary for the practitioner to be familiar not only with the requirements of his patients, but also with the means whereby these needs may be satisfied. The material presented in this paper is an attempt to clarify some of the factors in the ever-expanding field of multifocal corrections.

Criteria for prescribing separate near corrections, bifocals, or temporary diagnostic glasses are discussed. The optical factors in bifocal lenses—image jump, object displacement, segment height, decentration, width, and field of view—are reviewed. Various occupational requirements involve consideration of object size and location. Tables are presented which indicate the visual acuity required for various size objects at different distances and for determining the power of an add for a new visual distance. The indications for trifocals are discussed with the aid of tables showing ranges of clear vision through bifocal and trifocal corrections.

It is generally recognized that the *measurement* of the ocular functions involved in near point vision is much more of a "science" than is the judgment of what to prescribe. In fact, prescribing has been considered more of an art than a science. It is this conception which makes it difficult for the beginning practitioner to learn how to prescribe intelligently. Too often, knowledge is gained only by experience, sometimes costly to the doctor as well as the patient. To elucidate some of the information by which experienced practitioners are guided may help to make prescribing more scientific.

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ANNOUNCEMENT

HATTON PRESS PUBLISHES "TEXTBOOK ON ORTHOPTICS"

The Hatton Press, 69 Aldwych, London W.C.2., England, has recently published the "Textbook of Orthoptics" by H. W. Gibson, F.B.O.A., F.S.M.C., D.Orth. The author has been active in orthoptic work in the London Refraction Hospital for a number of years, and is one of the top authorities on the subject in England. The new text is about 500 pages, one-third given over to theory and the remainder to the clinical aspects of the work. The cost of the book is 42s.

EFFECT OF SLOPED TEXT UPON THE READABILITY OF PRINT*

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When printed copy is held flat, with the plane of the copy at right angle to the line of sight, the printed symbols are seen in their exact form. Through experience, some people have sensed that printed material seems easier to read when maintained in a position that does not deviate markedly from this angle. As the copy is tipped down and away from the right angle alignment, the geometric forms of letters become distorted. And the greater the slope, the greater the distortion. For instance, if the reader is sitting up straight, the normal and comfortable line of vision is perpendicular to the plane of the copy when the latter is sloped about 45 degrees from the vertical. But when the copy is lying flat on the table, i.e., 90 degrees from the vertical, there is some distortion of letter forms. Many people, both children and adults, do reading and study with the text lying flat on a table. Occasionally some people, in reading a newspaper, slope it below the horizontal, i.e., more than 90 degrees from the vertical.

When printed symbols are distorted by sloping the text downward away from the plane that is perpendicular to the line of vision, it is probable that readability of the print is less than optimum. The problem in the present study is to measure the influence of sloped text on the readability of print in terms of speed of reading and visibility of words.

MATERIALS AND PROCEDURE

The reading material consisted of Forms I and II of Tinker's Speed of Reading test.[1] In each form there are 450 items of 30 words each. As a check on comprehension, the reader crosses out (or speaks aloud) the one word that spoils the meaning of each item. Since responses are more than 99 per cent correct, the test virtually measures speed of reading with comprehension constant. The two forms, which are approximately equivalent, were printed in 10 point Excelsior type in a 20 pica line width with 2 point leading on white eggshell finish paper stock. Enough material for 5 minutes reading was cut from the

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1. Published by the University of Minnesota Press, Minneapolis, Minn., 1955.

tests and mounted on light gray cardboard as follows: one section of Form I, starting with item 1; three sections of Form II, one starting with item 1, one starting with item 133, and one starting with item 265. Form II was also printed in 8 point Excelsior type in a 12 pica line width with 2 point leading on white eggshell finish paper stock. As with the 10 point, three sections of the 8 point were prepared on cardboard.

For the visibility measurements 16 five-letter words from the 10 point print and the same 16 from the 8 point print were cut from the text and mounted on white cards, one word per card.

A special reading stand was constructed which permitted the copy to be held in any position from the vertical to sloped 30 degrees below the horizontal. Since the stand was hinged at the bottom, the different degrees of slope were achieved by tipping the stand down and away from the subject. In all instances the readers' eyes were maintained at a constant distance of 17 inches from the reading copy by means of a head rest. The reading stand was used for both the speed of reading and the visibility measurements.

The experiment was conducted in a laboratory which provided 25 footcandles of indirect well-diffused incandescent illumination. The subjects were 300 university sophomores. In each speed of reading comparison there were 75 subjects. In the visibility measurements, the number of subjects varied from 31 to 55.

In the speed of reading measurements there were four sub-groups: (1) The first group was a control group whose members read Form I and the three parts (a, b, c) of Form II all in 10 point type and with the reading stand maintained throughout at a 45° slope, i.e., perpendicular to the line of vision. Equivalence of the reading materials when given in this order is revealed by the results. (2) In the second group, subjects read Form I in 10 point and all three parts of Form II in 8 point type, both forms held at the 45° slope. (3) In the third group, Form I was read in 10 point held at the 45° slope. Form II was in 10 point. Part (a) was read sloped at 90° (horizontal), Part (b) sloped at 10° below horizontal (—10°), and Part (c) sloped at 30° below horizontal (—30°). (4) In the fourth group Form I was in 10 point and was read at 45°. Form II was in 8 point. Part (a) was read at 90°, Part (b) at —10° and Part (c) at —30°.

Each subject was tested individually. A practice exercise was given first, and then the subject read for a five-minute period under each of the conditions described above, one five-minute period on Form I followed by three successive five-minute periods on Form II. Subjects

adapted to the illumination used during the practice period. The subjects were instructed to read as fast as possible and not make mistakes. They spoke aloud the one word in each item that spoiled the meaning.

The visibility measurements were made at the same sitting as the speed of reading, by means of the Luckiesh-Moss Visibility Meter. These measurements were made under the same conditions as the speed of reading measurements, i.e., 45° in comparison with each of the other slopes. After four practice words, the visibility of 6 words was measured at the 45° standard position and another 6 at one of the other slopes. The experimental design permitted visibility measurements at two slopes only for each subject. The order of presentation was systematically varied in the speed of reading and in the visibility measurements.

RESULTS AND DISCUSSION

Data for the effect of sloping text upon speed of reading 10 point print are given in Table 1. The reliability of performance for five minutes of reading, Form I vs. Form II, is consistently high as shown by the coefficients in column eight. The correlations range from +0.87 to +0.95.

TABLE 1

EFFECT OF SLOPING TEXT UPON SPEED OF READING TEN POINT PRINT

(N = 75 university students in each comparison, 150 in all)

Test Group	Test Form	Slant of Print: Degrees	Mean	SE_M	Difference between Corrected Means* in Paragraphs	Difference between Corrected Means* in Per Cent	r	D SE_D
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	I	45	47.30	1.17	0.00	0.0	+0.95	
	IIa	45	45.38	1.16				
B	I	45	47.30	1.17	0.00	0.0	+0.93	
	IIb	45	48.18	1.33				
C	I	45	47.30	1.17	0.00	0.0	+0.91	
	IIc	45	48.87	1.37				
AA	I	45	49.27	1.29	—2.83	—5.7	+0.92	5.50
	IIa	90	44.52	1.20				
BB	I	45	49.27	1.29	—4.35	—8.8	+0.89	6.63
	IIb	—10	45.80	1.42				
CC	I	45	49.27	1.29	—8.44	—17.1	+0.87	12.95
	IIc	—30	42.40	1.28				

*The difference between the Means in each of the Groups AA, BB, and CC is "corrected" by the amount of the difference between the means of their respective control groups A (+1.92), B (—0.88), and C (—1.57).

Mean scores in test groups A, B and C provide information on the equivalence of Form I vs. Forms IIa, IIb and IIc. In Group A, Form IIa is read 1.92 items slower than Form I; IIb, 0.88 items faster than Form I; and IIc, 1.57 items faster than Form I. In computing the

differences between means. Column six, these differences are used as corrections as indicated.

The corrected differences show that copy lying flat on table (90°) was read 5.7 per cent slower than copy at 45° slant; that copy slanting 10 degrees below the horizontal (—10°) was read 8.8 per cent slower than at 45°; and that copy slanting 30 degrees below the horizontal was read 17.1 per cent slower. At 45° the text was at right angles to the line of vision. So the greater the slant away from this "normal" reading position, the greater the retardation effect on speed of reading. All these differences are significant beyond the one per cent level.

TABLE 2
EFFECT OF SLOPING TEXT UPON SPEED OF READING EIGHT POINT PRINT
(N=75 university students in each comparison, 150 in all)

Test Group	Test Form	Slant of Print: Degrees	Mean	SE_M	Difference between Corrected Means* in Para-graphs	Per Cent	r	D SE_D
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D	I	45	51.20	1.38	0.00	0.0	+0.93	
	IIa	45	48.31	1.26				
E	I	45	51.20	1.38	0.00	0.0	+0.92	
	IIb	45	47.77	1.41				
F	I	45	51.20	1.38	0.00	0.0	+0.91	
	IIc	45	47.53	1.52				
DD	I	45	50.19	1.28	—4.05	—8.1	+0.95	10.12
	IIa	90	43.24	1.28				
EE	I	45	50.19	1.28	—3.80	—7.6	+0.93	8.08
	IIb	—10	42.96	1.25				
FF	I	45	50.19	1.28	—7.42	—14.8	+0.89	13.10
	IIc	—30	39.11	1.22				

* The difference between the Means in each of the Groups DD, EE, and FF is "corrected" for type size by the amount of the difference between the means of their respective control groups D (+2.89), E (+3.43) and F (+3.67). Means for IIa, IIb, and IIc have already been corrected for equivalence of test forms from data in Control Groups of Table 1.

The effect of slanting text upon speed of reading eight point type is found in Table 2. Coefficients in column 8 indicate high reliability. Groups D, E and F give the differences between 10 point type (Form I) and eight point type (Forms IIa, IIb, IIc). These differences are taken into account in the mean differences in Groups DD, EE and FF. In comparison with text at the 45° slant where the line of vision is perpendicular to the page, text lying flat on the table (90°) was read 8.1 per cent slower, text slanted slightly below the horizontal (—10°) was read 7.6 per cent slower, and text slanted 30° below the horizontal was read 14.8 per cent slower. All these differences are significant beyond

the one per cent level. As with 10 point print, fastest reading occurs at the 45 degree position where the line of vision is perpendicular to the copy.

Incidentally, it might be noted that the eight point print was read significantly slower than 10 point print. The differences are given in the footnote of Table 2.

The effect of slanting text upon the visibility of printed words is given in Table 3. The first comparison slows the difference in the difficulty of the two groups of words used. The difference of 0.46 was added to the second mean in each comparison to obtain the "corrected" differences listed in column 6.

TABLE 3

EFFECT OF SLOPING TEXT UPON VISIBILITY OF PRINTED WORDS

Slant Compared	Type Size	N	Mean	SE_M	Difference between Corrected Means* in Score	Per Cent	r	D SE_D
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
45°	10	55	4.70	.21	0.00	0.0	+0.95	
45°	10	55	4.24	.19				
45°	10	52	4.82	.20	—0.87	—18.1	+0.94	9.71
45°	8	52	3.48	.13				
45° vs.	10	32	4.94	.23	—0.17	—3.4	+0.92	1.85
90°	10	32	4.31	.22				
45° vs.	10	33	5.10	.25	—0.90	—17.7	+0.85	6.09
—10°	10	33	3.74	.14				
45° vs.	10	31	4.96	.25	—1.57	—31.7	+0.85	9.82
—30°	10	31	2.92	.12				
45° vs.	8	33	3.57	.15	+0.24	+6.7	+0.82	2.52
90°	8	33	3.34	.16				
45° vs.	8	33	3.65	.19	—0.29	—8.0	+0.93	3.42
—10°	8	33	2.88	.12				
45° vs.	8	32	3.60	.15	—0.93	—25.8	+0.84	9.94
—30°	8	32	2.21	.08				

*The differences in Column 4 are "corrected" by the amount of the difference between the mean scores in the Control Group to equate for differences in difficulty of the words used. The difference amounts to +0.46 of a point for each test group comparison and is added to the second mean in each comparison.

The third comparison is between 10 and eight point print. The eight point is 18.1 per cent less visible than 10 point. As shown in column 9, this is a significant difference.

Reliability of performance is satisfactory. The coefficients in column 8 range from +0.82 to +0.95.

The next three comparisons in Table 3 are concerned with the effects of slanted print upon the visibility of words in 10 point print. The greater the deviation of the slant from the 45 degree position, the greater the loss in visibility. The losses are 3.4, 17.7 and 31.7 per

cent respectively for 90, —10 and —30 degrees. The first difference is only significant at the 6 per cent level, but the others are beyond the one per cent level.

The last three comparisons near the bottom of the table deal with the effects of slanted print upon visibility of words in 8 point print.

A peculiar result occurs in the comparison of the 45 degree with the horizontal (90°) text. Words lying flat on the table were significantly more visible than those on the plane perpendicular to the line of vision (45°). Apparently some unknown factor produced the reversal. The result is contrary to what was found with 10 point print. Also, both the 10 and eight point print were read slower at the 90 than at the 45 degree position. However, the eight point print was eight per cent less visible at the —10 degree slant and 25.8 per cent less visible at the —30 degree slant. These latter results are in harmony with what was found for 10 point print.

The implications of the findings in this study are obvious. The best conditions for clear perception and fastest reading are to have the printed copy held in a position that is perpendicular to the line of sight. If one is sitting upright, this position is approximately 45 degrees from the vertical (or horizontal). When the printed material is lying flat on a table, the print is less visible and is read slower. If sloped a little below the horizontal as sometimes occurs in everyday situations, the deleterious effects are enhanced.

These findings have application wherever reading is done as at home, in school, in the library, etc. In a few instances, attempts have been made to improve the visual task by sloping the working surface. School desks are sloped upward slightly but probably not enough in most instances to achieve maximum visual efficiency. Drawing boards in many drafting rooms are adjustable to several degrees of slope. Practically no libraries provide sloping surfaces to hold books for reading. Some people, of course, have discovered that it is easier to read when books or other reading materials are held at a slope which approaches the 45 degree angle. It seems reasonable to suggest that greater publicity be given to the advantages of holding printed material in the position which provides best readability.

SUMMARY

1. The purpose of this study is to measure the effects of sloped text upon the readability of print in terms of speed of reading and visibility of words.

2. Textual material for both speed of reading and visibility of words was held on a reading stand which could be sloped at any desired angle.

3. Parallel studies were conducted for reading 10 point and for reading 8 point type.

4. Illumination was held constant at 25 footcandles.

5. Measurements were made at a 45 degree slope (perpendicular to line of sight), at 90 degrees (flat on table), at 10 degrees below the horizontal, and at 30 degrees below the horizontal.

6. Subjects were 300 university students, 75 in each sub-group. All subjects were tested individually.

7. All measurements had high reliability.

8. In comparison with the 45 degree angle, 10 point type was read significantly slower at all other slopes. The retarding effect was greater, the greater the degree of slope downward from the 45 degree position. For the 8 point type the trend was similar.

9. Trends in the visibility measurements were in general similar to those for the speed of reading. With one exception (8 point type at 90 degrees), the visibility was less the greater the slope downward from the 45 degree position.

10. Print is read significantly slower and is less visible when lying flat on a table than when held at right angle to the line of sight. This has important implications for schools, libraries and other situations where reading activities take place.

ANNOUNCEMENT

SURVEY OF OPHTHALMOLOGY

Volume 1, Number 1, of the new SURVEY OF OPHTHALMOLOGY was mailed early in March of this year. This publication is largely devoted to abstracts of ophthalmic literature. It is edited by Frank W. Newell, M.D., of the University of Chicago, assisted by a distinguished Board of Editors and issued six times each year, by the Williams & Wilkins Company, Mount Royal and Guilford Avenue, Baltimore, Maryland. Annual subscription (6 issues—total 600 pages), $9.00 in U. S. A., $9.25 in Canada and $9.75 foreign and postal union.

ANISEIKONIA DUE TO CHANGES IN CORNEAL CURVATURE CAUSED BY A DENDRITIC CORNEAL ULCER—A CASE REPORT*

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The patient, a 34 year old male, was first examined at the refracting clinic of the Los Angeles College of Optometry on October 15, 1954. The case history provided the following information: He had had a "dendritic corneal ulcer" eight months ago affecting the right eye. Objects appeared "smaller and thinner" with his right eye than with his left eye. For three months he had used O.D. —0.75 D. sphere and O.S. —0.25 D. sphere. The patient noticed a size difference with or without his glasses but a greater difference with them. Previous to the appearance of the dendritic ulcer he had not worn glasses and had never noticed any difference in image size between the two eyes. An "atypical Herpes Zoster" affected the entire right side of his face and he had had surgery on the right eye for the "removal" of the ulcer. He had suffered a solar burn in the right eye when twelve years of age and now had a "central scotoma" in that eye. The patient is an engineer and a pilot and stated that his perception of distance had been affected by this condition and that this had proven a great handicap to him.

The preliminary examination on October 15, 1954, in the refracting clinic of the Los Angeles College of Optometry provided the following findings:

EXTERNAL: A corneal scar on the right eye slightly temporal and inferior to the pupil, oval in shape, about 2mm. long and 1mm. wide, and just barely involving the pupillary area. The left eye proved negative.

COVER TEST: Orthophoric at infinity, slightly exophoric at near.

AMPLITUDE OF CONVERGENCE: 2"

VERSIONS: Negative.

UNCORRECTED V. A.: O.D. 20/30 O.S. 20/15

OPHTHALMOSCOPY: Small reddish spot in the center of the macula of right eye, not observed in left eye. Fundus O.D. and O.S. otherwise negative.

OPHTHALMOMETER: O.D. 45.75/90 MER. O.S. 45.00/90 MER.
44.00/180 MER. 44.50/180 MER.

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STATIC RETINOSCOPY: O.D. —0.75—0.75X15 20/20—
O.S. —0.50 sphere 20/15
SUBJECTIVE: O.D. —0.75 —0.75X20 20/20
O.S. —0.50 sphere 20/15
FAR POINT PHORIA: 1Δ exophoria.
FAR POINT B. O. DUCTION: 8/32/28
FAR POINT B. I. DUCTION: 8/6
VERTICAL PHORIA: Zero
NEAR POINT PHORIA: 6Δ exophoria. Gradient 100/—3
DISSOCIATED CROSS CYLINDER TEST: +1.50 O.D.
+1.25 O.S.
Phoria through above 12Δ exophoria
BINOCULAR CROSS CYLINDER TEST: +1.50 o.u.
Phoria through above 12Δ exophoria
NEAR POINT B. O. DUCTION: 8/36/24
NEAR POINT B. I. DUCTION: 9/26/18
NEAR POINT VERTICAL PHORIA: ½Δ Left hyper.
RIGHT & LEFT SUPRADUCTION: 3/1
POSITIVE RELATIVE ACCOM.: —2.25
NEGATIVE RELATIVE ACCOM.: +1.50

Following this examination, the patient was referred to the Aniseikonia Clinic of the Los Angeles College of Optometry. The first aniseikonic examination was performed on October 25, 1954, with the space eikonometer. The lenses were mounted in an A. O. Trial Frame #2390-A, A. O. Tillyer lenses, and plano cylinders were employed. The test was conducted with the subjective findings obtained on October 15, 1954. The results of this examination showed: 0.75% x 90 in the right eye and 3.00% x 180 in the right eye, with a zero declination error, sensitivity 0.50%. These findings would be similar to those expected based on the difference in refractive error between the two eyes.

Following this examination a consultation was held with the patient and he was informed of the nature of his condition and of the possible methods of solving his problems, i.e., contact lenses or iseikonic prescription lenses. The patient was further informed that the fitting of contact lenses could possibly reactivate the corneal ulcer. The patient decided that he would prefer to wear contact lenses inasmuch as he greatly disliked wearing glasses. The patient was then referred back to his ophthalmologist to determine if he approved the fitting of contact lenses, which he did.

An attempt was then made to fit both corneal and scleral contact lenses to the patient, but he did not prove a good subject for contact lenses and this approach was finally discarded.

A second subjective examination was then performed on December 20, 1954, with the following findings taken:

O.D. —0.50 —1.00 X 10 20/25—
O.S. —0.25 —0.25 X 165 20/20+

A second aniseikonic examination was performed on the same day with the following findings taken:

0.50% X 90 in the right eye.
2.50% X 180 in the right eye. Zero declination error. Sensitivity 0.50%.

Since the patient appeared to be an acute observer and described the perceived size differences so accurately, it was decided to do a trial and error examination with alternate occlusion while the patient viewed a square frame on the wall. It is realized that this method is not recommended for determining the image size differences between the two eyes. However, the author felt it would be of interest to determine just how the findings for equalization of the images with this procedure would compare to the findings taken with the space eikonometer. In order to perform an examination with the alternate occlusion procedure, afocal plastic size lenses furnished by the Aniseikonic Forum were used. The patient at no time knew what the magnification power of the lenses placed before his eyes were, and powers other than indicated were deliberately used to ascertain the validity of the patient's responses. The refractive prescription before the patient's eyes was the same as that used during the second examination with the space eikonometer.

The patient was asked to draw the image as seen by each eye individually to determine how they differed in shape and size and approximately how much difference was present. His drawing indicated that the right eye image was both shorter and narrower than the left eye image. Lenses of various magnification were then used to equalize the size and shape of the images. Lenses were placed before the right and left eye, and the power was increased to reversals in both meridians during the test.

The patient demonstrated keen powers of observation and could differentiate 0.50% changes with ease. After repeated tests to definitely establish valid results, it was found that the patient noted subjective equality of the images with: 0.75% X 90 in the right eye and 2.25% X 180 in the left eye. As can be seen, these findings are within 0.25% of those taken with the space eikonometer.

Iseikonic lenses were then ordered for the patient of magnification powers based upon the second examination with the space eikonometer.

The lenses were dispensed on February 18, 1955, and the patient

immediately stated that objects appeared very clear, of equal size, and that he had much better depth perception "just like I used to have." After wearing the lenses a week, the patient continued to be very pleased with the prescription, with the maintenance of equal and clear images and good depth perception.

On March 18, 1955, the patient visited the author and stated that a few days ago he began to notice a difference in size. The patient was examined while wearing his iseikonic prescription and a 1.00% X 90 in the left eye, a 0.25% X 180 in the right eye, and a zero declination error was found. The author observed during the external examination that the corneal scar appeared larger than before and slightly vascularized. The patient was informed that it was very likely that the dendritic ulcer had become reactivated and this may once again have influenced his vision. He was referred back to his ophthalmologist for further observation. The patient reported shortly thereafter that his ophthalmologist had found the ulcer reactivated and that further treatment of the ulcer would be necessary.

The patient was treated for this condition for some time and finally reported back on November 22, 1955. He stated that his ophthalmologist had once more stabilized the condition and that he would like another examination as the vision in his right eye was now very poor. The examination revealed the uncorrected V.A. in the O.D. was 20/400 and that the scar had increased greatly in size and shape. It was now about 5mm. long and 2½ mm. wide, occupying the same general corneal area as before.

The static findings were:

O.D.	—0.75 —3.50 X 57	20/40—
O.S.	—0.50 sphere	20/15

The subjective findings were:

O.D.	—0.75 —3.75 X 60	20/40
O.S.	—0.25 sphere	20/15

It was felt that before conducting any further tests for aniseikonia, that the patient have another refractive examination in two weeks to determine if the refractive state was actually stabilized. The patient was thus examined again on November 22, 1955. The subjective findings were: O.D. —0.75 —3.50 X 68 and O.S. —0.25 sphere

A slight shift in axis of the cylinder was thus found. This may have been due to actual changes in corneal curvature or to variation in responses. In any event a major change in refractive error had taken place since the condition reactivated. It was decided to perform another aniseikonic examination with the prescription found on November 22.

1955. During this examination, the amount of magnification required before the right eye was so high that a 4.00% afocal meridional lens had to be placed in the trial frame before the right eye. The results of this examination were as follows: 7.50% X 90 in the right eye, 1.50% X 180 in the right eye with a .3 red declination error, 0.75% sensitivity. These findings are again similar to those expected on the basis of differences in refractive error.

The patient reported that the new prescription caused extreme distortions in space, as might be anticipated, but that these distortions were all but alleviated when the proper afocal magnifying lenses were placed before his eyes.

At present no new prescription was given. It was decided to wait another month or so to see if any further changes take place. The ophthalmologist did not now recommend the use of contact lenses to correct the refractive error. It appears that two choices are now present: (a) not to correct the right eye, leaving vision poor, or (b) to correct it with an iseikonic lens which would be quite thick and cosmetically unattractive. The patient was informed of these possibilities and stated he would like to attempt the iseikonic prescription, and this will probably be done once the condition remains constant.

SUMMARY: A patient with aniseikonia apparently due to difference in refractive errors created by a dendritic corneal ulcer is described. The case is of particular interest due to: (1) The creation of aniseikonia by a dendritic corneal ulcer which caused changes in corneal curvature. (2) The patient's subjective awareness of differences in image size and disturbances in depth perception following the onset of the condition and its subsequent reactivation. (3) The accuracy with which the patient was able to subjectively equalize the images with the use of afocal size lenses and alternate occlusion as compared to the findings taken with the space eikonometer. (4) The variations found in the amount of aniseikonia present as the refractive state varied. (5) The need of an additional afocal meridional size lens in a trial frame to measure the aniseikonia with the space eikonometer. (6) The close correspondence of aniseikonia found in relation to difference in refractive error. (7) The great improvement enjoyed, even though temporary, when the iseikonic lenses were worn.

THE INFLUENCE OF AGE ON THE SPEED OF ACCOMMODATION*

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INTRODUCTION

The influence of age on the speed of accommodation may provide a clue to the fundamental nature of the clinically noted reduction of amplitude with age. It has generally been assumed that accommodation fails in old age because the crystalline lens becomes hardened. Such an event, however, poses theoretical difficulties in the interpretation of our limited data on the apparent constancy of the accomodative-convergence accommodation (A.C.A.) ratio with age. The theories of accommodation and the neural and muscular physiology are likewise subject to close scrutiny to explain such a phenomenon as the "constant" A.C.A. ratio with age.

It is the purpose of this paper to present the data obtained on subjects ranging from 7 years to 49 years of age and to speculate on the mechanism of aging of the accommodative mechanism.

HISTORY

A history of some of the studies on accommodation is here presented and reveals that no precise picture of the speed of the accommodative act was obtained until the work of Kirchhof[1] (1941), who photographed the changes in curvature of the lens of the eye during the increase and the relaxation of accommodation.

Some indication of the speed of accommodation was given earlier by Volkmann[2] (1857), Barrett[3] (1885), Vierordt[4] (1857), and Aeby[5] (1861), but not until Feree and Rand's[6] work in 1918, was a major effort made to study the speed of accommodation on a group of individuals. There followed similar studies by Banister and Pollock[7] (1928), Robertson[8] (1935, '36, '37), Leukart[9] (1939), and Travis[10] (1948). None of these studies provided data of accuracy comparable to that of Kirchhof and all investigators either worked with a limited age range or a limited dioptric range or both, hence the need for a study to obtain better data in this area.

*Read before the annual meeting of the American Academy of Optometry, Chicago, Illinois, December 10, 1955. For publication in the April, 1956, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

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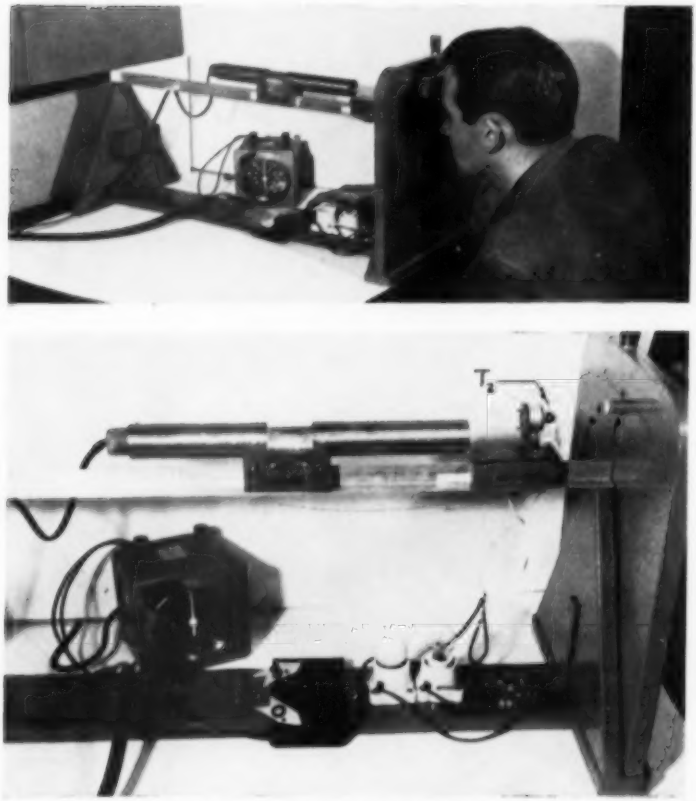

Fig. 1. (Top) The general arrangement of the apparatus is shown with a subject in position. The operator sits to the left of the subject. (Bottom) The two movable target mechanisms are in position on the upper track. T_1 is within the tube while its image, T_1', is projected approximately into the plane of T_2 shown in the photograph. T_2 is a photographic print on film. The arrows, S and O, indicate the subject's response switch and the operator's starting switch. (T_2 is normally out of the beam to the eye until the O switch is pushed.)

EQUIPMENT

It was determined to make the apparatus as simple, flexible and accurate as possible. Figure 1 shows photographs of the apparatus as finally built. This is basically a reaction timer with the stimulus being a blurred target to be cleared as part of the subject's reaction.

Figure 2 shows the optical layout used. The system includes a shutter mounted target, T_2, which interrupts the light forming the optical target, T_1'. Either the target T_1' or the shutter target T_2,

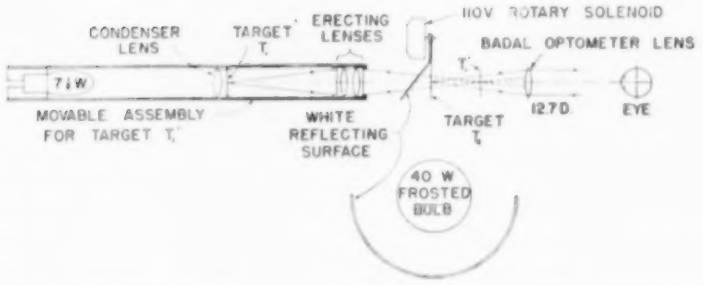

Fig. 2. Optical layout of the apparatus in Figure 1. The stimulus to accommodation is specified at the entrance pupil of the subject's eye.

could provide any stimulus value from 11 diopters to zero by proper selection of its distance from the fixed Badal optometer lens. The entrance pupil of the subject's eye was always placed at 7.87 cm. from this fixed lens as shown. The targets were made from a Snellen chart reduced so that a 20/20 row of letters was available to the subject. Two such identical targets were used, one at T_1 and the other at T_2. Their alignment was such that when T_2 snapped into the beam from T_1 it appeared exactly in the same lateral and vertical position as T_1' had been. The Badal Optometer system used, provided a constant retinal image size regardless of the stimulus to accommodation. T_1 was always visible initially.

The operator was provided with a *starting* switch which simultaneously started a clutch-type laboratory clock, calibrated in 1/100 second units, and operated the 110V rotary solenoid to present the second accommodative stimulus T_2.

The subject in turn had a *stopping* switch which stopped the clock and removed the target shutter from the beam thus resetting the apparatus for a new cycle. The operator read the timer, recorded the subject's time to relax or accommodate whichever the case may be, and finally returned the clock to zero, completing the cycle.

PROCEDURE

The subject was shown the method of operation of the apparatus and given 20 or 30 practice trials on a simple reaction time response to the click of the target. He was then practiced in the control of his accommodation and the speed of his response by completing the entire 30-45 minute experiment in detail. He was re-scheduled for a second time on a subsequent day when the final data which are here presented were taken. The practice data were discarded.

Five or more responses were taken at a given stimulus to accommo-

dation and care was taken to be sure that the subject had time to recover clear vision of his starting target before the next cycle was started. The experiment started at zero stimulus to accommodation and the time for *recognition* of the second target, when also in the same plane, was recorded. *Clearing* (accommodation) times were then measured in diopter steps to the amplitude of accommodation, the time required to accommodate from zero to each level of the stimulus to accommodation being recorded as the experiment progressed. Untrained subjects having trouble controlling accommodation were encouraged to look for the object "up close," "near by," "on your nose" or to "cross your eyes." This latter techniquie worked particularly well on the children.

Relaxation data were obtained by starting with target, T_1', fixed at or near the maximum accommodative amplitude while target, T_2, was placed at different stimulus test levels progressing from zero to the maximum level of accommodation. Thus, for example, the average time to relax from ten to zero diopters was first obtained followed by the time to relax from ten to one diopter, then ten to two, ten to three—ten to nine and finally ten to ten. (Data taken always relaxing to zero diopters were quite erratic, possibly due to the difficulty experienced by most observers as they tried to relax the last bit of accommodation.)

RESULTS

Figure 3 presents three graphs which summarize all data obtained in this study. In all cases the starting point of each curve has been made to coincide so that direct comparisons could be made. Figures 4 and 5 group the response curves of the subjects who had about the same amplitudes. These curves are presented as obtained, without any effort to equate starting times. Note also that the A.C.A. ratios as well as the ages of the various observers are included on Figures 4 and 5.

DISCUSSION

From Figure 3 we see that the time to accommodate seems to increase as the amplitude decreases. This is perhaps more readily seen in Figures 4 and 5. The time required to relax is remarkably faster than to accommodate. (This was true of all subjects except one whose data were not included in this study.)

Note in Figures 4 and 5 that even though the amplitudes are the same, the younger man tends to show the more rapid change in lens shape both in accommodating and relaxing. Note also that there appears to be no relationship between the A.C.A. and the age, amplitude or the rate of change of accommodation. Subject J.S.R., age 49 (and three subjects in their 50's not included), shows a response essentially devoid

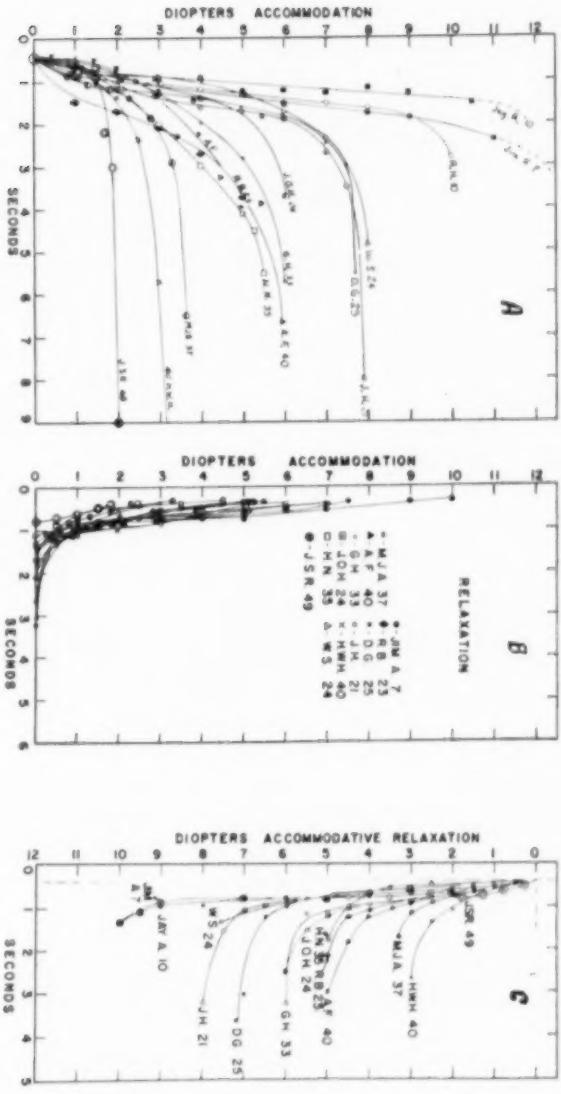

Fig. 3. a. The accommodation curves have been equated to the same starting time. b. The relaxation curves have been equated to the same starting time. JAY A.'s data have been omitted because of similarity to JIM A.'s data. c. The relaxation curves have been equated both as to time and starting point. This is the same data as in 3b.

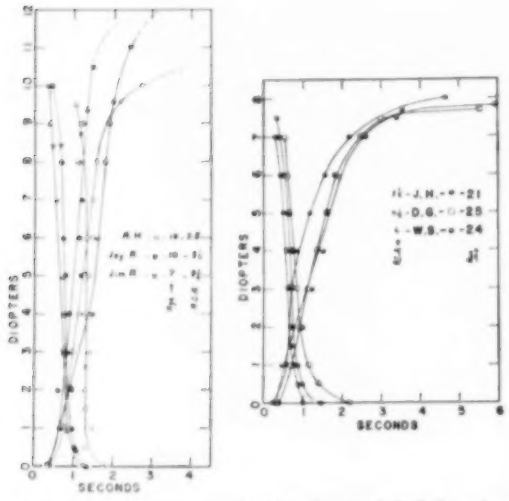

Fig. 4. Curves grouped according to amplitude. Age and A.C.A. values are indicated.

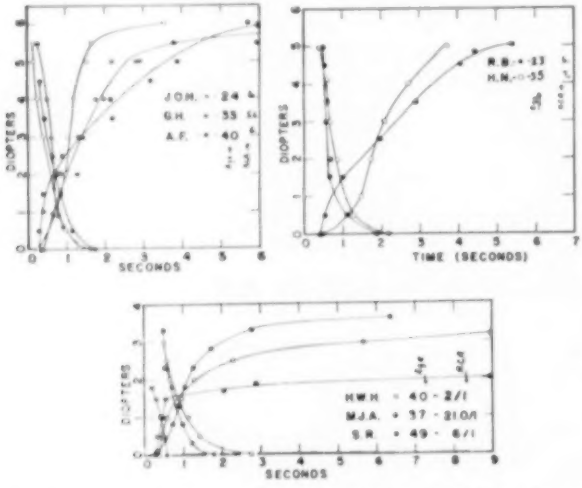

Fig. 5. Curves grouped according to amplitude. Age and A.C.A. values are indicated.

of any change in lens shape. With difficulty J.S.R. could show about 0.4 diopters of accommodation on the coincidence optometer of Fry. This agrees with the results of Marg and Ong[13] who found zero amplitude after the age of 52.

The fact that the younger observers change accommodation faster may be indicative of a lowered viscosity[11] of the lens substance or a greater separation of the lens fibers bathed in the viscose material. The latter is more probably the case. The ceiling to accommodation is approached at a rapidly decreasing rate indicative of having reached the limit of stretch or deformation of lens structures (the lens fibers?). Since the number of fibers increases with age and the amount of viscose material probably decreases,[14] the amount of total "slip" of the components within the lens must therefore be reduced while the friction between them is increased.

In regards to the A.C.A. ratio, note that in Figure 5, subject H.W.H. has an A.C.A. of 2/1 while M.J.A. has an A.C.A. of 20/1. Since the response curves are reversed from what we would expect if the A.C.A. were higher because of increased lens resistance, the viscosity of the lens cannot be used to explain the A.C.A. ratios encountered.

It is conceivable that a major factor in the A.C.A. ratio could be the lenticonus observed by Fincham[12] which some subject's have and others do not. Thus subject H.W.H. may have a marked lenticonus while subject M.J.A., with a more flexible lens, may have none.

SUMMARY AND CONCLUSIONS

A method is presented of measuring the speed of accommodation and the relaxation of accommodation based upon the time required to clear a target.

The results indicate: (1) that the lens changes shape faster in youth than in maturity; (2) that the act of accommodation is considerably slower than the relaxation of accommodation; (3) that there appears to be no correlation between a high A.C.A. ratio and an increased lens viscosity; (4) that further study of the viscosity of the lens and of the phenomenon of lenticonus may provide additional data of value in understanding the accommodative aging phenomena.

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ANNOUNCEMENT

OPTOMETRIC LEGISLATION PASSES IRISH HOUSE OF PARLIAMENT

The Ophthalmic Opticians (optometrists) and the Dispensing Opticians of Ireland report that the Irish House of Parliament has passed legislation setting up a special register of practitioners for each group. The Bill outlines the standards of practice for optometrists and dispensing opticians; it establishes minimum educational standards and provides for a Board of Examiners. The Bill restricts the prescribing and dispensing of spectacles to registered medical practitioners and optometrists, and in the case of dispensing only, to opticians.

To become a law the Bill must pass the Irish Senate and be signed by the President of the Republic. Both of these are considered concluding formalities and it is unlikely that any change will be made in the Act. This is the first law governing optometry and dispensing opticianry in Ireland. Northern Ireland is not effected by this legislation.

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INTERPROFESSIONAL RELATIONS IN THE FIELD OF EYE CARE

The recent developments in interprofessional relationships recall the statements made by the School Committee of the Indiana Optometric Association, published in the December, 1948, Journal of the I.O.A., under the title of "Medical and Non-medical Refractions." Pertinent excerpts from these statements follow:

"Most optometrists agree with Post[1] that refraction properly belongs in the field of ophthalmology as well as optometry. These same optometrists would also agree with Post[2] that it is absurd for everyone performing refractions to have surgical training as well as training in refraction. The incidence of disease affecting vision is far less than the incidence of refractive errors and/or muscular anomalies. It is in the interest of the public's visual welfare, as well as its economic welfare,

that two groups of qualified and accredited refractionists be developed: (1) the medical and surgical eye specialist who also performs refractions; and (2) refractionists who also make fundus examinations, test visual fields, give orthoptic training, and fit contact lenses."

The average optometrist today not only refracts and dispenses his own prescriptions for glasses, but also makes fundus examinations and field charts in order to determine those with pathological indications for referral. Many are also developing the specialties in the field, i.e., orthoptic training and the fitting of contact lenses, sub-normal vision aids, and aniseikonic lens corrections.

Returning to the School Committee statements, "Heath[3] suggested that ophthalmic technicians be trained at the universities by medical instructors in the subjects pertaining to those duties as above outlined in the description of the duties of refractionists. These technicians would work in the offices of ophthalmologists and presumably would not have any standards to meet, similar to those required for state board examinations and licensure in optometry.

"Crisp[4] questions this proposal on the ground that it would require a considerable length of time to start, that it would tend to reduce the opportunities for the development of young ophthalmologists, that it would reduce the direct personal relationship between ophthalmologists and patients, that such a technician might prove to be an effective competitor to an ophthalmologist when working in an office of a physician practicing eye, ear, nose, and throat, and that finally, some of these technicians might be induced to work for osteopaths or chiropractors, "or even for optical concerns which advertise expert examination in refraction." We would like to point out that any refractive technician working for someone other than a physician would violate optometry laws in most, if not all, States. However, what would prevent an outstanding refractive technician going to an optometric college for several years, thus qualifying himself for an optometric license and then practicing his specialty on his own? Furthermore, is not the public more likely to receive better and more intelligent refraction from either an ophthalmologist or a competent optometrist, than from a technician?

"Most optometrists and ophthalmologists are agreed that both medical and non-medical refractionists are needed. The difficulty which now exists is that some ophthalmologists would prefer to see the optometrist eliminated and replaced by refractionists of technician status under the aegis of the ophthalmologist. One has only to look back to the recent war to remember the lack of confidence members of the Armed Forces had when optometrists, then working as technicians in the Army,

made refractions. How many of the civilian, paying public would be willing to place the care of vision in the hands of a technician even though that technician were working for an ophthalmologist? After all, the technician is doing the work—not the specialist. In many instances it has been found difficult to gain public acceptance even in delegating the comparatively simple duty of fitting and adjusting glasses to the faces of patients.

"Post[2] suggests that optometrists and ophthalmologists get together to compose their differences "without animosity, in friendliness, and on an equal footing, bearing in mind primarily the visual welfare of the public."

"It would appear that this suggestion would come closest to fulfilling the actual needs of the public. It recognizes the fact that optometrists are here to stay, and that the refractive needs of the public could not be satisfactorily met without them, since the replacement of the existing optometrists by qualified ophthalmologists would be almost incomprehensible even if facilities for training such men were greatly expanded. In addition, the delegation of the ophthalmologist to pure refraction is both an economic and professional waste of his training. Yet, if the optometrist were replaced in equal number by the ophthalmologist, vast numbers would find themselves given the opportunity to see too few pathological or surgical cases to maintain their specialized skills, and would, of necessity, be placed in the position of practicing only refraction. It would seem more realistic to assume that the ideal solution would be the coupling of the optometrist as a qualified member of the team working to conserve vision and prevent blindness, and that the respective numbers of both optometrists and ophthalmologists, and the proportion of pathological and refractive cases, would best distribute themselves in the public welfare by an arrangement which included an ophthalmologist for every several optometrists, the latter working in harmony and cooperation with the former.

"Although the Section on Ophthalmology[5] and the American Medical Association[6] have seen fit to declare it unethical for physicians to lecture before or instruct optometrists, it should be remembered that the basis for the teaching of refraction to optometrists is the same physics, physiology, and physiological optics as that taught to ophthalmologists. Optometry is not a cult in the sense that it teaches a method of diagnosis or treatment based on unsound, unscientific premises. There have been, and are now, radical cultists on the fringes of the main body of optometrists, the same as there are on the main body of physicians. But the basic teaching of refraction to both optometrists and

ophthalmologists has been the same. The American Medical Association has recognized this principle of non-cultism in its relations with the chiropodists."

In 1950, the American Medical Association passed a resolution declaring "that it is entirely within the definition of medical ethics for its members to engage in lectures, demonstrations, the dissemination of information designed to prevent blindness and directed to any non-medical group."

Following the passage of this resolution, national and state committees were formed to develop better eye care programs through inter-professional cooperation. Unfortunately, certain individuals both within and without the professions and for reasons best known to themselves, began to stir up ill feeling between the members of the two professions. This ill feeling finally culminated in resolutions passed by both the American Optometric Association[8] and the American Medical Association,[9] each of which unfortunately can be interpreted as critical of the other profession.

Now the public needs the services of both optometrists and ophthalmologists. The members of both professions would do well to reflect on the fact that this is the only reason for the existence of the two professions. It is humbling to realize that the only assurance of the continued existence of these two professions will be determined on how well they fulfill the needs of the public in the field of eye care.

The role of the dispensing optician has been a disputed point in the last few years. By far and large, most dispensing opticians work with ophthalmologists in filling and dispensing ophthalmic prescriptions. Optometry, for the most part, has taken the attitude that problems arising in this area should be handled by the ophthalmologists and opticians themselves. However, that the future may bring closer working relationships between optometrists and dispensing opticians along with the increased population and the increasing needs of the public for eye care, is not beyond the realms of possibility. Certainly, optometry has an interest in the proper regulation of all those engaged in the field of eye care. Certainly, the opticians should be encouraged and helped to be given the means whereby they can establish proper standards of practice in their own field. The matter of their professional and economic status will be determined by the public as was the status of both optometrists and ophthalmologists.

In a toast to the British Optical Association proposed by that eminent British ophthalmologist Sir Stewart Duke-Elder on the occasion of the inauguration of the Eye Service under the British Ministry of Health, he stated to the optometrists present: "No matter what the

Ministry of Health may do, and they are doing more or less what we tell them, they may design a service, but whether or not the service works depends absolutely upon whether you and we work together. I have little doubt that the service will be very good. It is true that from now on we are all one family. We may have our family quarrels, but after all, they serve only to make family relationships more real. We have one common aim and that is to provide efficient service for the ordinary people—who cannot see. May this cooperation grow, not only in little things like the Contact Lens Society and our mutual sharing of literature: not only in relatively big things like the planning of our National Health Services: but in the biggest thing of all, the working together as a team for the benefit of humanity."

The eye care professions here in these United States have had our "family quarrel." Is it not time now to turn our thoughts and energies to the sole purpose of our existence—i.e., the conservation of vision and the prevention of blindness, both optometrically and ophthalmologically, as the case may be?

ROBERT W. TUBESING

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PUBLISHERS NOTICE—A special subscription service has been arranged to assure subscribers in military service of receiving their copies of this magazine each month. Subscribers are urged to immediately forward changes in their military addresses as these occur, giving name and rank, service unit, hospital, camp, naval port or air force base. Also previous address. Journals will be individually forwarded to men in service irrespective of the number of month-to-month changes that occur.

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BOOK REVIEWS

THE SPECIAL-TRANSMISSIVE PROPERTIES OF PLASTICS FOR USE IN EYE PROTECTION. Subcommittee on Transmissive Properties of Plastics. American Standards Association, 70 East Forty-Fifth Street, New York 17, New York. 48 pages. Board. $1.50, 1955.

This booklet will serve very well as an optical plastics handbook for the optometrist. In about a dozen pages, the chemistry and physics of all of the various plastics which have optical possibilities are briefly but excellently discussed. In addition, methods of fabrication and problems encountered in fabrication of optical materials from plastics are explained in sufficient detail to help the optometrist decide which plastic lens or frame might best be suited to a particular job. For example, cellulose nitrate, the plastic from which nearly all "plastic" or "zyl" frames are made today, is described as a material which takes a very high polish but which will not stand steady exposure to heat or ultra-violet rays. In addition, it burns faster than any of the other modern plastics. Such material is clearly not generally suitable as an industrial frame for lenses.

Another example of a modern plastic, Columbia Resin 39, a polymer of diallyl diglycol carbonate, is a synthetic resin which begins to approach glass in abrasion resistance but still retains the impact resistance of a plastic. The physical and chemical properties of CR-39 described in this report show rather clearly why at least two lens manufacturing companies are using this resin in place of glass for protective lenses.

No currently manufactured plastic lens, plain or colored, can be used as a screen for infra-red rays since plastics, in general, do not stop infra-red rays. A process by which a thin layer of metal is deposited on the lens surface can provide this protection, but metal coating of plastic lenses is still not a perfected process. Many plastics do act as effective ultra violet screens, however.

One hundred six graphs provide spectral transmission data in this report. Eighty-nine references and three tables of physical and chemical data, plus the graphs and discussion mentioned above, make this an extremely valuable reference manual.

NEAL J. BAILEY, O.D., PH.D.

HEALTH SERVICE IS A BASIC RIGHT OF ALL THE PEOPLE. Dewey Anderson, Ph.D., Public Affairs Institute. 312 Pennsylvania Ave., S. E., Washington 3, D. C. 70 pages. Board. 50¢. 1955.

This document is an expression on the present status and probable future of health care by the Director of the Public Affairs Institute, an organization supported by many leading legislators, labor officials, and persons in public life. Dr. Dewey Anderson has had extensive training in biology and public health, and has been in public life and politics for over twenty years. The booklet is written in four chapters covering the health needs of the American people, the available health facilities, occupations within the health field, and an evaluation of the rights and privileges of health practitioners and the general public in the health field.

The description of the practice of optometry is a concise and excellent presentation for the public of the role of optometry in the health field. The following paragraphs illustrate the attitude of Dr. Anderson:

"The profession of optometry has emerged from a long struggle for recognition as a bonafide professional part of the health personnel of the nation to become an accepted part of the community rendering an important service.

"The struggle still goes on, however, between some of the medical profession and the optometrists. The conflict centers around the age-old theme of an emerging profession, in this case, optometry, seeking to broaden its service and recognition as fully capable of examining, prescribing and fitting eyes with glasses.

"While the profession does not seek to occupy the specialized place of the ophthalmologists, its sphere of activity is increasing. Some optometrists are performing public service in highway safety and industrial lighting work, others are becoming trained in the allied sciences related to vision so that their service as consultant is increasingly sought. Having won recognition to the point where they are accorded professional status in most communities, optometrists are on their way toward broadening of their practice to serve more people."

In the section on the rights of practitioners of the various health arts, the author points out that the definitions under which various states grant licenses to practice the healing arts are all "dated," that is, "they are the product of political give and take at the time they were passed, usually some years ago when some of the professions were only in their infancy, and when scientific knowledge was meager. These definitions now form barriers to the proper performance of the professions." Increasingly, the day-by-day conduct of a practitioner may be substantially at variance with the strict interpretation of his license to practice. This rigidity limits the growth and competence of a profession.

Included in the booklet are enlightening discussions of the role in the health field and the professional training of practitioners of medicine,

osteopathy, chiropractic, clinical psychology, dentistry, nursing, chiropody, and of the several health aides including dieticians, X-ray technicians, physical and occupational therapists and others. The booklet gives a discussion, from an informed layman's point of view, of the relations and the disputes among the various health groups, particularly with reference to the relation of the other groups with organized medicine. The reviewer believes that the several groups which are continually receiving the "harpoons" of organized medicine owe much to the Public Affairs Institute for bringing these conflicts to the attention of the public in a manner which clearly shows that the public's interest is not necessarily that of organized medicine. The legislative representatives of optometry will undoubtedly have occasion to quote passages from the booklet.

In the section on prepaid national health insurance, Dr. Anderson expresses his conviction that a universal prepayment plan seems to be the direction of movement in the field of public health. The opposition of the American Medical Association and other allied groups may postpone this development for a number of years but will not prevent it.

The reviewer feels that this booklet is important for all who are interested in health, either as a practitioner or as a member of the public. In addition, optometrists will wish to refer to it as a source of authoritative lay opinion concerning optometry.

DARRELL B. CARTER, O.D.

COLLEGE OF OPTOMETRY
UNIVERSITY OF HOUSTON
HOUSTON 4, TEXAS

THEORIES OF PERCEPTION AND THE CONCEPT OF STRUCTURE—A REVIEW AND CRITICAL ANALYSIS WITH AN INTRODUCTION TO THE DYNAMIC-STRUCTURAL THEORY OF BEHAVIOR. Floyd H. Allport, Ph.D., Published by John Wiley & Sons, New York City. 709 pages. Cloth. $9. 1955.

Professor Allport has made himself a leader of American psychology by decades of sober scholarship, which he combines with a virile catholicity of viewpoint and a rare skill for presenting the recondite in palatable morsels. Perhaps closer than anyone else, he follows the William James tradition of refusing to disallow the rich heritage of philosophy which gives substance to the present-day preoccupation with the "objective." While he calls himself a "behavioristic social psychologist," he is much less physicalistic in approach than the term implies.

His latest contribution is impressive not only because of its scope—vast areas of research are summarized in relatively few pages—but for

the insights the author provides, which help illuminate and unify a host of diverse viewpoints. This reviewer, being the opposite of a "behavioristic social psychologist," rather strongly disagrees with many of Allport's conclusions: he must nevertheless respect an impressive piece of summative scholarship. The optometrist willing to devote the time necessary to master this volume and at least a part of its bibliography, will considerably enrich his perspective in the process.

Under the general theme of attempting to unify the field of perceptual theory, Allport critically summarizes a host of historical and contemporary viewpoints. It is the latter which is most important. The reader will find here a review of the recent contributions of Hebb, Gibson, Freeman, Brunswik, and some others, too recent to be found elsewhere except in the original. Hull's final formulations are reviewed, and a chapter is given to cybernetic theory. In effect, we have here an intellectual "Readers Digest."

While claiming a certain aloofness from gestalt theory, and presenting it in a historical vein, it is interesting how repeatedly, throughout this book, Allport resorts to gestalt formulations to view the diverse. The reviewer feels that in the specific chapters devoted to gestalt theory, there are some basic misunderstandings by Allport. He seems to identify gestalt psychology with the isomorphism of Köhler. In contrast, it was Wertheimer's often expressed view that this concept was rather superficial to gestalt theory and, to quote Wertheimer, "premature." Again, Allport overemphasizes the "trace theory" of Koffka and fails to recognize the centrality of the concept of Prägnanz.

The final chapter is devoted to Allport's own theory of event-structure, "presented as a suggestive rather than a definitive or final solution." The reader who has braved the preceding pages will be in a position to evaluate this contribution for himself.

WILLIAM F. GARBER, O.D., D.S.SC.

2617 EAST LAKE STREET
MINNEAPOLIS 6, MINNESOTA

OUR BLIND CHILDREN—GROWING AND LEARNING WITH THEM. Berthold Lowenfeld, Ph.D., Published by the Charles C. Thomas Company, Springfield, Illinois. 205 pages. Illustrated. Cloth. $5.50, 1956.

The author presents much practical advice based upon the recognition that blind children, or children with uncorrectable sub-normal vision of 20/200 in the better eye, are essentially like other children, but must be given opportunities for growth which are satisfying to them.

In presenting this material the author takes the parents through the nursery school, kindergarten and other school periods, stressing various forms of educational facilities now available for blind children and how to get the most out of these aids for these children.

Dr. Lowenfeld received his Ph.D. Degree in Psychology from the University of Vienna, Austria. He held a Rockefeller Foundation Research Fellowship in the Social Sciences and taught blind children for more than 10 years. He has been the Director of Educational Research for the American Foundation for the Blind, New York City, and instructor in Special Education, Teachers College, Columbia University. He is a fellow in the Divisions of Educational Psychology of the American Psychological Association.

This is a book written for the parents of blind children. It also contains much information of value to optometrists. The entire work is presented in a sympathetic and realistic approach and will prove to be most helpful to those parents with blind children or with children with uncorrectable sub-normal vision. In addition the book will vastly encourage parents faced with the task of giving a blind child the proper and best start in life. According to the author there are 10,000 such blind children of school age in the United States. This book has an important message for the parents of each of these children.

CAREL C. KOCH, O.D.

CORNEAL CONTACT LENSES. L. Lester Beacher, O.D. Published by the author, 564 Springdale Ave., East Orange, New Jersey. 45 pages. Cloth. 1956.

This book results from reprinting a series of articles that appeared in the OPTOMETRIC WEEKLY during 1955. These articles deal with the history of contact lenses; their various types, forms and construction; their application; optical principles; manner of insertion and removal; examination and refracting routines necessary; problems the optometrist will have to solve, and the instructions to give to patients. The book also deals with the corneal contact lens.

The author is a diplomate of the Contact Lens Section of the American Academy of Optometry. He has been fitting contact lenses of all kinds since 1940 and has taught the technique in private classes. This book contains his conservative viewpoints on this important subject of growing interest to optometrists.

RUDOLPH EHRENBERG, O.D.

GRANITE FALLS, MINNESOTA

CURRENT COMMENTS

Terry Judith Parkins
Editorial Assistant

Optometrists will confer a favor by sending news items of general interest for this department, such as relate to new instruments, clinical techniques, education, visual health and optometric legislation and organization.

THOUGHTS ON BETTER RELATIONS

I have just finished proof reading the editorial in this issue "Interprofessional Relations in the Field of Eye Care" by Dr. Robert W. Tubesing, Richmond, Indiana, past president of the Indiana Optometric Association, and now vice president of the Academy. Dr. Tubesing is also Secretary of the Indiana Interprofessional Committee on Eye Care, a State committee which has been most active and doing excellent work. This made me think about interprofessional relations, and as one of my jobs is to look over current literature for ideas to use in this column it struck me, that perhaps, we were overlooking a man who might be of help in improving these matters.

The man I am thinking of is Martin Topaz of Chicago. Mr. Topaz is not a doctor, nor is he an optician, but he has a great number of friends among the optometrists, ophthalmologists, and opticians. As most everyone in optometry knows, he publishes the OPTOMETRIC WEEKLY for optometrists, the EYE, EAR, NOSE AND THROAT MONTHLY for ophthalmologists and oculists, and the OPTICAL INDEX for opticians. He is the son of Dr. Lionel Topaz who founded the publishing house that gets out these three publications.

With his large acquaintance in all three fields, why not get his help in molding professional opinions towards the end that the groups again work in greater harmony at the organizational level? In his singular position as publisher, he has entrees not accorded to most, and through his personal contacts and journals, he would be a powerful force for better understanding if he were only given an opportunity to work more closely with the official families now concerned with these matters.

Another thought on this same subject is, that good relationships are founded on respect and confidence. In my contacts with people in ophthalmic optics, I am sometimes surprised at the lack of knowledge on the part of some as to what is really going on. A number of ophthalmologists still feel that optometrists are not well trained. Frequently, optometrists express the idea that ophthalmologists know little or nothing about refraction. Perhaps there was a day when these things were

true, but at this time the young diplomate of the Board in Opthalmology has a good background in all the subjects necessary for proper refraction, and, of course, the present day five or six-year undergraduate training period for optometrists eliminates all doubt as to his ability to examine and refract. The point, however, is that these educational facts have not been brought home to all members of each group. I do not know how to do this, but I am sure when each understands the excellent training given the other, much cause for friction will be removed.

THREE NEW SUGGESTIONS

Received for our comment this month were three items designed for use in the routine office examination. With new ideas of this sort it is our practice to refer these to the attention of Dr. Henry W. Hofstetter, Director, Division of Optometry, Indiana University, Bloomington. Dr. Hofstetter's comments follow: One is a new near point card designed by Dr. H. E. Pine, Chicago, and distributed by the New Era Optical Co. The card consists of several graded paragraphs printed in green type, and several paragraphs in red type, both on a white background. According to the instructions the patient should see the green letters better if he needs more plus add, and vice versa. The second is a 2"x2" Kodachrome view to be projected on a screen so as to superimpose and surround the conventional test letters projected separately, thus to induce the sensation of greater distance. This suggestion comes from Dr. Morris J. Almstead, Jordan, New York. The third is a brochure from the General Test Equipment Co., East Norwalk, Conn., describing a new ophthalmic projector called the Acuitometer. Their particular claim to the superiority of this projector is its simplicity of operation. Its other features are also described in a brochure which they will mail on request.

THE SHEARD VOLUME

Just this month, we have received from the Chilton Company, Philadelphia, the galley proofs on the coming *Sheard Volume*. These galleys are now in the hands of the author and the proof readers, and by mid-summer the book should be off the press. This brief report is to acquaint the 580 optometrists, ophthalmologists and opticians who contributed funds to make this book possible, that it is finally in the works. The Chilton Company are the publishers for the committee. They also publish THE OPTICAL JOURNAL AND REVIEW OF OPTOMETRY. The The book will run close to 500 pages, and will be handsomely bound in cloth. A more complete announcement regarding this book will be made in one of our coming issues.

REGISTRATION TIME — A.O.A. CONGRESS

This is advance registration time for the coming Congress of the American Optometric Association at Miami Beach June 13-16. The registration fee is $25.00 for each member optometrist, $15.00 additional, should the member bring his wife. Non-professional guests and children are also $15.00. These fees include a banquet ticket. The committee would appreciate advance registrations. They should be sent to Dr. Seymour G. Schneider, 1602 North Washington Avenue, Miami Beach 39, Florida.

MINNEAPOLIS IN 1958

The Minneapolis District Optometric Society has voted to invite the American Optometric Association to hold its 1958 Congress at Minneapolis. It is planned that the Minnesota State Optometric Association will take similar action in inviting the A.O.A. to Minneapolis before the 1956 Miami Beach meeting, and the official State invitation will be presented in Florida in June. The 1957 A.O.A. Congress is scheduled for Los Angeles. Minneapolis was host to the A.O.A. in 1950, and if the 1958 invitation is accepted, the Minnesota group will have its hands full in putting over a better Congress than the one in 1950.

EMIL H. ARNOLD FELLOWSHIP

A fellowship in the amount of eighteen hundred dollars provided through an endowment at the Ohio State University by Dr. Emil H. Arnold, Ann Arbor, Michigan, will be available for the 1957-1958 school year.

To be eligible, an applicant must have been enrolled in the Graduate School at the Ohio State University for study in optometry and physiological optics for a length of time sufficient to have demonstrated ability to qualify as a candidate for the Doctor of Philosophy degree. This fellowship will be known as the Emil H. Arnold Fellowship, and preference will be given to a resident of the State of Michigan in making the award.

ACADEMY CALL FOR PAPERS

The annual call for papers on the part of the Papers and Program Committee will go in the mail just about the time this issue of the Journal is off the press. The Committee under the chairmanship of Dr. J. Donald Kratz, member of the faculty, Pennsylvania State College of Optometry, is again requesting all Academy members to indicate their

intentions as to submitting original papers to be read before the Academy at Houston, Texas, in December. Members are urged to respond at once, and supply the committee with the data requested in the Papers and Program questionnaire.

POST-GRADUATE COURSES AT HOUSTON UNIVERSITY

A group of Post-Graduate Courses is being given at the College of Optometry, University of Houston, April 15-18. The schedule calls for one series of four subjects to be taught on Sunday and Monday, April 15-16, and another series of four subjects on Tuesday and Wednesday, April 17-18. Optometrists will attend either or both of the two-day sessions. Each of the subjects offered will consist of eight hours of instruction in two days, but only two subjects may be taken during each two-day series.

On Sunday and Monday, April 15-16, the subjects are: "Graphical Analysis of Optometric Data," Dr. Darrell B. Carter; "Visual Training," Dr. Chester H. Pheiffer; "Pathology," Dr. Jack G. Daubs; "Advanced Techniques for Refraction," Dr. Boyd Eskridge. On Tuesday and Wednesday, April 17-18, the subjects are: "Developmental Vision," Dr. Jane Brent; "Use of the Slit Lamp in Optometric Practice," Dr. Bernard Mazow; "Income Tax and Office Accounting," Dr. I. E. McNeill; "Psychology of Reading," Dr. Stanley E. Davis.

1957 OPTICAL FAIR AT CHICAGO

Here we go again! The second Optical Fair is scheduled for the Palmer House, Chicago, Illinois, June 7-10, 1957. Many new features will be introduced that were not a part of the first Optical Fair held at the same place in 1954—and *that* Fair was top-flight. Outstanding educational exhibits of special interest to each segment of the industry and professions will be featured. The Fair committee will make every effort to make these features attractive to optometrists attending the Fair.

The newest and latest in equipment, instrumentation, fashion eye wear, and machinery will be included. A modern laboratory will be installed.

The Fair Club, that was such a success in 1954, will be enlarged. This special meeting room for visitors will be appropriately filled with tables and chairs where optometrists and their guests may relax. In the center of the new Fair Club will be an attractive merry-go-round bar. Another new feature at the 1957 Fair will be an evening style show

in the Ballroom of the Palmer House that will be open to the public. The 1957 Optical Fair is sponsored by the Optical Manufacturers Association.

EASTERN SEABOARD CONFERENCE

The first Eastern Seaboard Conference on Visual Training will be held in Washington, D. C. on May 22, 1956, at the Willard Hotel. This will be an invitational symposium and will draw its participants from optometrists practicing along the Eastern Seaboard who are either interested in or actively doing visual training in their offices. The purpose of the conference is to give these optometrists an opportunity to present original papers on orthoptics and to discuss visual training procedures.

Dr. A. M. Skeffington, Director of Education, Optometric Extension Program will be Chairman at the conference. Registration should be made through Dr. Robert A. Kraskin, 900 F. Street, N. W., Washington, D. C. Optometrists who wish to present papers should submit these before May 8 to Dr. Kraskin.

SOUTHERN CALIFORNIA OPTICIANRY ASSOCIATION

The Southern California Opticianry Association has been organized to promote basic education and training in all phases of opticianry. Better trained men are needed to fill key jobs in optical manufacturing plants, laboratories, and in retail opticians' stores and offices. Membership in the new organization is open to all opticians who have been certified by the American Board of Opticianry.

Dr. John Archer, of the Los Angeles City College, Opthalmic Optics Faculty served as temporary chairman at the first meeting which was held March 13 at the Commodore Hotel in Los Angeles. Mr. Russell L. Stimson, past president of the American Board of Opticianry, was the speaker of the evening. He reviewed the work of the American Board of Opticianry which serves as the certifying group for opticians who have completed a minimum of two years of specialized study in ophthalmic optics. He pointed out that the purposes of the new association are to further the knowledge of the science of optics and to promote and elevate the standards of opticianry. This can best be done through better educational facilities for opticians.

Mr. Marvin Schulz, Superior Optical Co., was elected President. The other officers are: 1st Vice President, Mr. Eugene Berez, J. H. Reich Optical Co.; 2nd Vice President, David F. Randolph, Ophthal-

mic Optics Faculty, Los Angeles College; Treasurer, Mr. William Rodman, Supernal Ophthalmic Laboratory; Corresponding Secretary, Mr. Frank Ohlmstead, American Optical Co., and the following were elected as members of the Board of Directors: Jack Spratt, Spratt Optical Co.; Gene Aberle, Bausch & Lomb Optical Co.; Robert Musser, Superior Optical Co.; Jules Baskin, Bausch & Lomb Optical Co.; Robert Kircher, Southwest Optical Co.; Paul Moore, C. F. McConnell Optical Co.; Elmer Hall, Westland Optical Co. The next meeting of this newly formed group will be May 18, 1956.

LIGHTHOUSE SUB-NORMAL VISUAL AID PROGRAM

The Chicago Ophthalmological Society and the Illinois Optometric Association, with the Chicago Lighthouse for the Blind, are sponsoring a non-profit optical aids program which has been in operation since June, 1955. The program is under the direction of a committee of five ophthalmologists appointed by the Chicago Ophthalmological Society—Drs. J. Robert Fitzgerald, Warren W. Kreft, James E. Lebensohn, Howard L. Lieberman and Daniel Snydacker; and five optometrists appointed by the Illinois Optometric Association—Drs. R. W. Bennett, Jerome B. Conlogue, Paul A. Ludeman, Glenn H. Moore and A. Raymond Rochte. This committee controls the policies and procedures, with the Lighthouse handling the financing and operating details.

The purpose of the program is to provide magnifying lenses, telescopic spectacles, and devices of various kinds to people with sub-normal vision. One of the devices that has been most useful is the insertion of a microscopic lens in the lower part of a carrier lens which includes the patient's distance prescription.

Every candidate for a sub-normal visual aid has a prior examination by an ophthalmologist. Those who have no ophthalmologist are examined by Dr. Charles A. Learsy, ophthalmological consultant to the Lighthouse. Those who have their own ophthalmologist are required to authorize their doctor to send an eye examination report to the Lighthouse, a report which includes the question, "Is an attempt to provide optical aids recommended?" The patient remains the patient of his own doctor with the optical aids program being a supplementary service to the ophthalmologist and the optometrist. A report of the findings is made to the doctor. The sub-normal visual work in the program, including the necessary training in the use of the devices, is handled by

Dr. Alfred A. Rosenbloom, Jr., member of the faculty, Illinois College of Optometry, who was appointed by the Optical Aids Committee. The work is done in the new Lighthouse building at 1850 W. Roosevelt Road.

About half of the legally blind people have some degree of vision, and some of them can be helped with optical aids. The Lighthouse interest includes people with any severe visual handicap. Most of those who come are not able to pay the costs and will require a subsidy by the Lighthouse. Those who can pay are charged on a basis of the costs to the Lighthouse. The intent of the program is to render a service to people with sub-normal vision and to ophthalmologists and optometrists in private practice.

NEWS BRIEFS

Dr. Harris Ripps of Columbia University was the speaker at the March meeting of the New York Academy of Optometry. His subject was "An Introduction to the Electro-Physiology of the Eye with some Clinical Correlates." . . . Dr. Oscar W. Richards, Research Supervisor for Biology, American Optical Company, lectured to the fifth year optometry students at Indiana University, Bloomington, on March 8. His topic was "Problems of Civilian Night Driving." . . . Dr. Collier Powell of the University of Dayton was the speaker before the Northeastern Ohio Chapter, American Academy of Optometry at its March 21 meeting in Cleveland. His topic was "Developmental Reading." . . . Dr. Daniel Woolf, New York City, spoke before the New Jersey Chapter, American Academy of Optometry on March 27. His paper dealt with the "Functional Approaches to the Solution of Visual Problems." . . . Dr. Paul F. Shulman, Illinois College of Optometry, spoke before the Northwest Illinois Optometric Association April 11. His subject was "Scleral Tonometry." . . . The last in the first series of eight "Four Star Forums" of the A.O.A. was held at the Bellevue-Stratford Hotel in Philadelphia, April 14-15. . . . Dr. Edward McFaul will speak before the Illinois Chapter, American Academy of Optometry on Friday, April 20 in the auditorium of the Illinois College of Optometry. His subject will be "The Relationship between Doctor and Patient." . . . Dr. Richard Feinberg, vice-president and dean, Illinois College of Optometry, spoke on "Optometry as a Career" at the 8th Annual Career Conference, March 24, Illinois Institute of Technology. . . . Shuron has another

attention getting ad in the April 14 issue of the SATURDAY EVENING POST. "He Didn't Strike Out—You Did" heads the ad, showing a crying youngster in a baseball suit. "Eye care today will boost his 'Batting Average' for life." . . . And while we are on the subject of ads stressing visual care we are pleased to report that the national advertising campaign now being run by the Better Vision Institute has been placed among the finalists for the SATURDAY REVIEW awards for distinguished advertising in the public interest. B.V.I. is certainly doing an outstanding and necessary job. . . . The average net income of optometrists in the United States is $9,442 according to a report just issued by the American Optometric Association.

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For years the national advertisers in the dental field have pounded home the idea that you should visit your dentist every six months. Gradually the idea caught on. It had value, and has become an accepted part of life with many patients. Through the pharmaceutical houses, medicine is stressing the idea of a yearly check-up. This idea, too, is gaining acceptance by more and more of the public. National advertisers in the visual field are now also pointing-up the advantage of a yearly eye examination and refraction as an aid in conserving eyesight. These programs are splendid and when they become fully accepted by the public they will do much towards making the optometrist an intimate part of the family health circle. They will also enable him to do a better job for his patients. So, let's do everything we can to stress the need for a regular yearly eye examination and refraction and thus tie in with the fine work already being done in our behalf.

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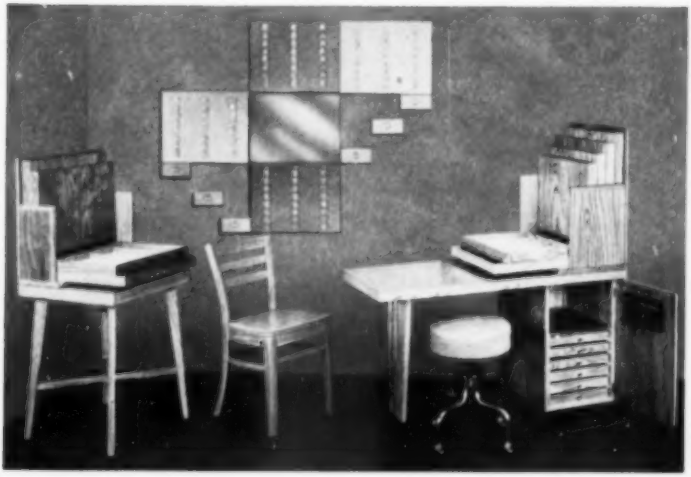

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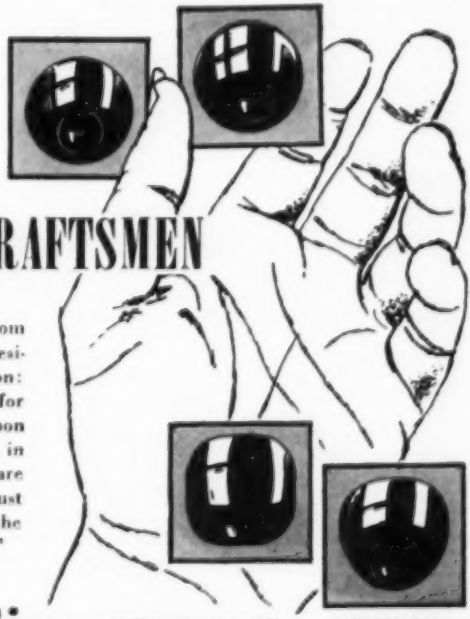

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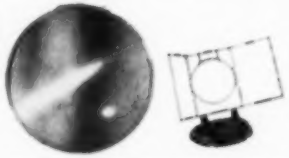

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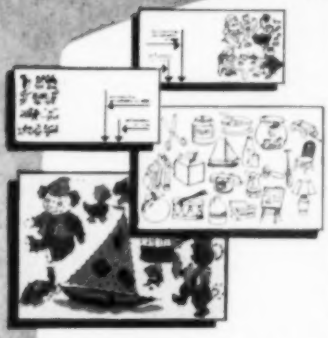

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FOUNDED IN NINETEEN HUNDRED FIFTEEN

Illinois College of OPTOMETRY

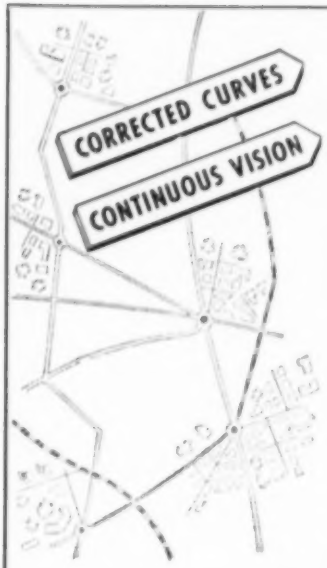
announces that applications for admissions to its classes beginning Sept. 10, 1956 are now being received.

3-year professional course
Leading to Doctor of Optometry Degree . . .

Requirements for Entrance

2 years (60 sem. hours or equivalent qtr. hrs.) in specified lib. arts and sciences.

FOR BULLETIN
PLEASE WRITE REGISTRAR
ILLINOIS COLLEGE of OPTOMETRY
3243 S. Michigan Ave.
Technology Center, Chicago 16, Ill.



Where do the roads of ophthalmic progress lead?

Scientific progress shows the right roads ahead more clearly with each passing year. This has been particularly true in the ophthalmic field. Those laboratories which have used only the quality products of the progressive manufacturer have found that they benefit and build both themselves and the doctors whom they serve.

This has certainly been true in the case of corrected curve lenses. Progressive laboratories everywhere stress their use—and they mean even more to the doctor and his patients. We lend our voice strongly to this suggestion. It is our firm belief that we serve better by supporting such recommendations.

We also add our voice to those of the increasing numbers who are advising the prescription of Continuous Vision Lenses in the practice of eye care. Produced on the excellent Univis Series of Corrected Curves, CVs represent the ultimate in performance for a substantial percentage of presbyopic prescriptions.

A COMPLETE Rx SERVICE

Twin City OPTICAL COMPANY

MINNEAPOLIS • MINNESOTA • WILLMAR

SPECIAL ANNOUNCEMENT!

Post-Graduate Contact Lens 3-Day Courses

in our CHICAGO and NEW YORK CITY offices

In order to supplement our work in the field we have set up a special schedule. The three-day courses are so laid out that the practitioner will have a better understanding of the fitting of contact lenses. The course will cover the fitting of all types of lenses with emphasis on the most successful types of contact lenses. Clinic and practical work will be stressed in every instance. Every member of the class will have a pair of lenses made for him.

The cost of the course is $65.00 which will include the cost of personal prescription lenses. Telescopic contact lens fitting, cosmetic contact lens fitting and other types of specialized fitting will be stressed.

CHICAGO	NEW YORK CITY
April 9-10-11	April 5-6-7
June 25-26-27	June 28-29-30
August 20-21-22	August 23-24-25
TIME:	**TIME**
10:00 am to 1:00 pm	10:00 am to 1:00 pm
2:00 pm to 5:00 pm	2:00 pm to 5:00 pm

The PLASTIC CONTACT LENS Co.
59 EAST MADISON STREET, CHICAGO 2, ILLINOIS

MAIL THIS REGISTRATION ORDER TODAY

The PLASTIC CONTACT LENS Co.
59 E. Madison St., Chicago 2, Ill.

Please enroll me for your special 3-day course.

☐ CHICAGO
☐ NEW YORK CITY on _____ *(date)*

Signed _____

Address _____

City _____ State _____

Enclosed please find my $25.00 as a deposit.

SOMETHING TO CROW ABOUT!

MANUFACTURERS

MERICAN OPTICAL COMPANY

RT-CRAFT OPTICAL COMPANY

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CTORY OPTICAL MFG. CO.

SION-EASE CORPORATION

LITE PRODUCTS CO., INC.

We feel justly proud in crowing about the manufacturers listed here. They are the ones that make possible the all-out BVI campaign to condition the consumer mind to accept and respect your services, skills, and materials. The dual theme of the 1956 BVI campaign is to *tune up and dress up* priceless eyes. The program encompasses all major media — national magazines, television, radio, newspapers, and literature for use at the patient level.

This campaign of consumer conditioning is expensive, and without the vision and substantial subscriptions of these companies that have your best interests at heart it would not be possible. You can show your appreciation by patronizing them to the limit. Fair enough? Better Vision Institute, Inc., 630 Fifth Avenue, New York 20, N. Y.

BVI THE NEED FOR EDUCATION NEVER ENDS

The Saturday Evening
POST
February 18, 1956 - 15¢

Shuron public service messages appearing regularly in the "Saturday Evening Post" are aimed at two important, basic objectives:

SHURON

SHURON OPTICAL C
GENEVA, N.Y.

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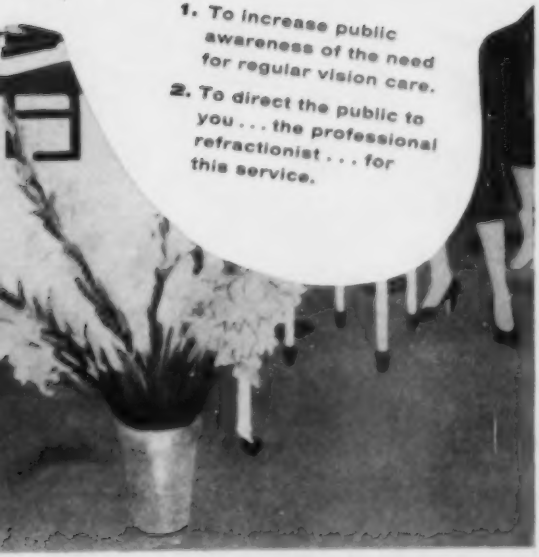
1. To increase public awareness of the need for regular vision care.
2. To direct the public to you . . . the professional refractionist . . . for this service.



L COMPANY, INC.

See the Shuron message in the APRIL 14 issue of the POST.